Issue 64 • 27 January 1990

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PALM-TOPS ON TRIAL

EXPRESS VERDICT

• Lynx: Launch imminent for Atari's colour palm-top.

• Gameboy: is Nintendo's mono console worth £100?

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PCW-to-PC solution for delayed word processor

TRANSFER PACKAGE FOR LOCOSCRIPT PC

Locomotive Software has announced a PCW-to-PC file transfer system for its forthcoming *LocoScript PC* package, which will now not be released until March 30.

The PC version of the million-selling word processor is aimed primarily at current and ex-PCW users upgrading to IBM-compatibles

According to Locomotive Technical Director Richard Clayton these upgraders "will know that with *LocoScript PC* they have a word processor which does what they want it to do – including printing £ signs properly!"

The transfer solution should prove an additional incentive to upgraders, as it will allow both *LocoScript 1* and *LocoScript 2* documents (all versions) to be tranferred from a PCW to a PC without loss of formatting commands.

The system will consist of a 'super cable' – containing all necessary electronics – and software, and will also be available from March 30. It will cost around £23, although Locomotive expects to offer it at a discount to users who return their *LocoScript PC* registration cards.

Locomotive says that the delay in *LocoScript PC*'s release has occurred because "Development work on the PC version has taken longer than we originally expected," but adds the the extra time taken will ensure that the word processor "can operate quickly and efficiently even on a simple PC system".

Locomotive can be contacted on 0306 740606. ■

Ninja warriors turn turtle

Amiga-, PC- and C64-owning US fans of the Teenage Mutant Ninja Turtles can now act out their Shredder-bashing fantasies in a computer game version of the adventures of the highly-popular carapaced crusaders.

The Ultra Games offering for the three machines follows well-received coin-op and Nintendo console versions, and gamers can switch roles between the four variously-skilled turtles to make their way through "a maze of mouser infested sewers, criminally polluted rivers and alleys patrolled by the fanatical Foot Clan".

Readers who can make sense of this information (unlike the baffled and old-feeling *Express* Editor) are probably already aficionados of the chelonian characters, which started life in comic book form and have since graduated to animated cartoons and a non-computer role-playing game of the traditional Dungeons and Dragons type.

No plans have been announced for a UK release, so you will have to keep those nunchukus in good condition and keep watching this space. ■

• Castle Master's *fast-moving solid 3D graphics, which use the Freescape system*

A spiritual experience in 3D

Those who find that an excess of spirits inhibits their ability to move around freely will meet a familiar problem in *Castle Master*.

The first Incentive game licensed to Domark, *Castle Master* is set in 16th Century England and requires players to rescue a prince or princess from one of four multi-storey castle towers. Progress is hindered by a surfeit of spirits – of the ghostly variety.

The game features Incentive's Freescape technique. It will be available from April 5 variously priced at £24.99 (PC), £19.99 (ST and Amiga), £14.99 (C64, CPC and Plus 3 disks) and £9.99 (cassettes). ■

Chips down at Hughes

Faulty computer chips were installed in vital hardware on the US Navy vessel which mistakenly shot down an Iranian airliner in 1988, according to an ex-employee of the Hughes Aircraft Company.

Michael Denlinger, a former Hughes engineer, has filed a law suit which alleges that the company sold $3.2 billion worth of potentially faulty chips, including those contained in the USS *Vincennes*' radar system when the ship accidentally downed a civil passenger aircraft over the Persian Gulf.

Suspect circuit boards – also allegedly used in a torpedo which failed trials – had cracked seals, making them subject to corrosion and failure.

Denlinger claims that Hughes Aircraft Company management was aware of the problem as early as May 1985, but was still selling the parts a year later. ■

Rumours rife as dealers add to STE confusion

The already confusing Atari STE saga began to take on a life of its own last week when two computer dealers revealed that they understood a stock recall had been initiated for the machine – a story quickly denied by Atari and its major British distributor.

Representatives of both dealers made unsolicited statements to *Express* staff that they believed the STE – a prematurely released souped-up version of the ST which has been plagued by software incompatibility problems – was to be taken out of circulation until around June. They said that their stock was to be replaced with less powerful but glitch-free STFM machines.

When *Express* contacted SDL, the UK's largest Atari distributor, to check whether the rumour had any substance, its director John Hamley denied vehemently that any form of recall would be taking place, although he confirmed that dealers who wished to exchange stocks of STEs would be welcome to do so.

"Why they should want to swap them, I've no idea," said Hamley, "other shops are crying out for stocks of the STE."

An even more irate Atari spokesman also categorically denied that any claw-back of STE stocks was in the offing, and went so far as to state that neither would SDL be exchanging dealers' STEs for STFMs on request. The spokesman said that he had talked to John Hamley only minutes earlier, and that as far as Atari was concerned no such offer existed. ■

• *Mac attack: cutbacks likely*

Apple pruned

Growth in the personal computer market is falling off more quickly than expected, according to Apple Computer in the United States.

The company has warned employees that it intends to reduce the workforce at its California headquarters following a lower-than-predicted net income for the quarter to December 1989. In a memo to staff, Apple chairman John Sculley stated: "In various parts of the world Apple's growth is slower than we anticipated... we are taking immediate action to bring expenses growth better in line with revenue growth."

The company will cut back on hiring new staff, consolidate departments and transfer some employees to positions in the field. The move follows a lay-off of 60 workers in Apple's Canadian subsidiary, but no decision has yet been announced regarding the company's European operations.

Said Sculley's internal memorandum: "We operate in a cyclical industry where even the most successful companies must have the flexibility to move quickly when times get tougher. This is one of those times." ■

Reprise for 16 Bit Fair

The next 16 Bit Computer Fair will be held at the Royal Horticultural Halls from Thursday June 28 to Sunday July 1, with the first day restricted to trade and press.

The first fair, which took place at the same venue earlier this month, was said by Westminster Exhibitions to have attracted more than 18,500 visitors and featured over 100 companies.

The organiser says that 90 per cent of existing exhibition space at the summer event has already been sold, and that more space is being arranged. The show will be open from 10 to 6 until Saturday, and will close at 4pm on the Sunday.

'Brain-altering' device launched on American market

SOVIET MIND MICRO ON SALE IN STATES

A computer has been developed in Moscow which, it is claimed, is capable of controlling thought patterns and even changing people's mood by mimicking waves generated by the human brain.

The extraordinary machine is soon to be launched in the US and Western Europe by Arizona-based Light and Sound Research for just $350. The company has licensed the computer from the USSR Academy of Sciences.

The MC2 is a small microprocessor unit not much larger than a games console. It is attached to a pair of dark glasses and set of headphones which the user is required to wear.

The processor controls a series of red LED lights which are attached inside the dark glasses, and a series of tones in the headphones. These lights and sounds are designed to emulate the patterns of human brain waves. Light and Sound Research says the device can be used to achieve deep relaxation and a state of "high creativity".

'Whole brain synchronization' can be achieved by putting on the glasses and headphones, lying back and closing your eyes to the direct source of the lights. Initially, the lights and sounds coincide with alpha and theta brainwaves generated when people are alert or in a normal working state.

Then they slowly change to copy the brainwaves generated by someone who is relaxing, and then meditating. The manufacturer says a person's mind will follow the sounds and lights leading him into a state of relaxation.

The frequency falls from 47 hertz to about 12 hertz over a period of between half an hour and two hours. The user can choose the time period for the relaxation-from 10 pre-programmed settings.

Carol Cummings of Light and Sound Research told *Express*: "We're going to see a real breakthrough of this type of computer over the next few years. It's the ultimate in relaxation devices. At the moment we're looking for distribution deals in Britain, West Germany and many more countries in Western Europe."

She added: "The Soviets are very good at this type of research, and we have every confidence in the MC2."

Light and Sound Research hopes buyers will be attracted to the idea of a 'mind machine' capable of achieving fast relaxation. Such brain states can speed up the learning process.

The firm does not believe that any cyberspace and science fiction connotations of mind machines will deter potential buyers.

Call 010 1 602 941 4459. ■

Toy fair showcase for Atari's Lynx hand-held

Atari has confirmed that its Lynx palm-top will be previewed at the British Toy Fair this weekend.

The show is primarily a trade event, and the company is presumed to be priming the pumps to maximise sales in the seasonal gift-buying boom next autumn.

An official release date has yet to be announced for the colour hand-held games console, and last week Atari even avoided commenting on the possibility of the trade being informed of launch plans at the fair.

"Obviously, the machine will be launched this year," said an Atari spokesman, "and you may assume that the Lynx will be one of the fastest selling items in this country next Christmas."

He added that the company expected there would be significant competition in the field, and that it was not in Atari's interests to make its release and pricing plans public at this stage.

• *Atari's colour hand-held games console, the Lynx. Launch date announcement due soon.*

Grey imports of the machine have already begun to appear in Britain, but industry pundits agree that Atari is likely to wait until early September before an official launch, after which "there will be plenty of Lynxes available, subject to world-wide production schedules".

While also reluctant to commit to a firm price for the Lynx, Atari says that it has noted "a number of rumours of a price around £149," and that it has "found this figure acceptable to High Street multiples' buyers". ■

• **See the full review of the Lynx on page 56.**

BASIC 2 Plus

BASIC DOESN'T HAVE TO BE BASIC ANY MORE!

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- full recursion
- ELSEIF statement
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- keyed files up to 2 billion records
- will read and write IEEE format numbers

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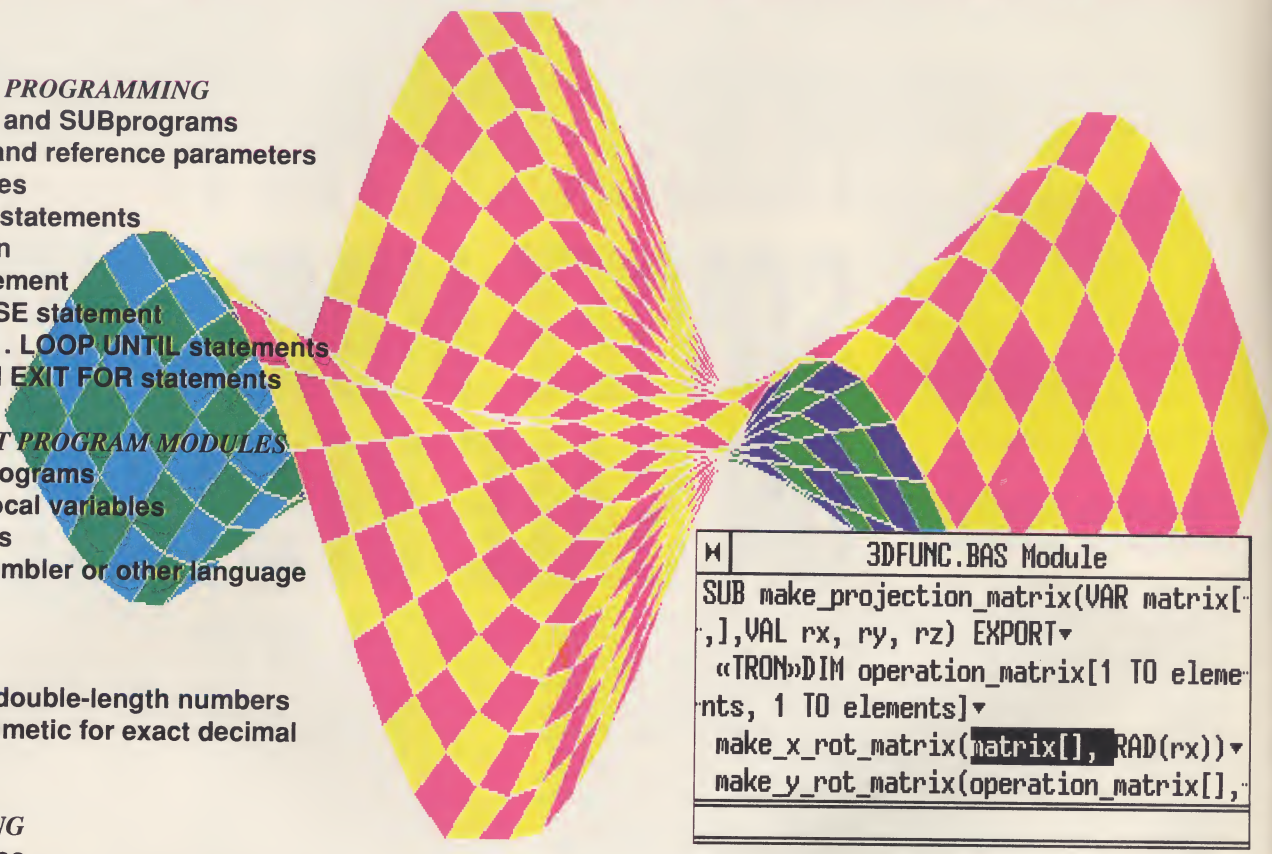

BASIC 2 Plus *is the new, improved version of Locomotive Software's BASIC 2 for the Amstrad PC. It's over six times faster , more structured and allows you to use separately developed modules. And of course, BASIC 2 Plus will run your existing BASIC 2 programs with little or no change.*

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Governors at risk from unscrupulous salesmen

SCHOOLS WARNED OF COMPUTER CON

School heads and governors have been warned by the Government and by manufacturers to be on their guard against unscrupulous computer suppliers.

It is feared that the temptation to buy locally and at a cheap price will make buyers vulnerable to misleading sales pitches by cowboy operators.

As schools take over responsibility from purchasing consortia for buying their own equipment, the Department of Education and Science has backed the launch of a suppliers' code of conduct aimed at ensuring bargain-hunting head teachers and governors are not conned into spending money on useless goods.

Guidelines for honest practice were recently unveiled at the DES by the British Educational Equipment Association, which represents 156 member manufacturing and distribution companies.

Schools' spending on equipment runs into hundreds of millions per year, and in his launch speech BEEA Director Dominic Savage pointed out as an example that the 450-pupil primary school of which he is a governor will soon receive a total delegated budget allocation of £500,000.

Said Savage: "The freedom of purchase will encourage many unscrupulous companies and many more unscrupulous salesman to desire a fast buck out of the education market.

"There will be pressure to purchase products which may well be appropriate in other environments but which do not meet educational standards."

Michael Page of Acorn, whose biggest market is education, warned at the launch that some computer manufacturers sold equipment to schools which was totally unsuited to their needs.

Said Page: "To a naive governor the deal may look very good, but it could end up costing the school several thousands of pounds, perhaps 50 per cent or more of their available funds."

To accompany its seven-point code of practice – designed to ensure that goods are suitable for their declared purpose, safe, of a proper quality and backed up by a high standard of customer support – the BEEA has published a new edition of its *Complete Guide to Educational Supply*, which lists and describes its members and aims to help schools identify the range of suppliers for specific products.

Around 36,000 copies of the publication have already been mailed to schools, colleges, universities and teachers' centres around Britain.

The BEEA can be contacted on 01-537 4997. ■

• *Cristie's huge 2.88Mb floppy drive.*

PC disks to double in size

A disk drive from Cristie Electronics is being touted by the company as the new standard format for PC-compatibles.

The 3.5-inch drive can store a huge 2.88Mb of data on a single disk. In addition, the drive moves data to and from the disk four times faster than ordinary 3.5-inch floppies.

The company says the secret of the increased capacity is the technique of 'vertical storage', with the data being recorded into the media rather than just along the surface. Cristie expects the main applications of the disk drive to be in hard-disk back-up, and in CAD and DTP work where large files are used.

The device is fully compatible with the existing 720K and 1.44Mb 3.5-inch standards. It can be fitted as an external unit to PC-XT and AT machines, and a version for PS/2s is due soon. Cristie expects the first PC incorporating the drive to be released before the summer.

The drive costs £399. Contact Cristie on 045382 3611. ■

2000 AD blues

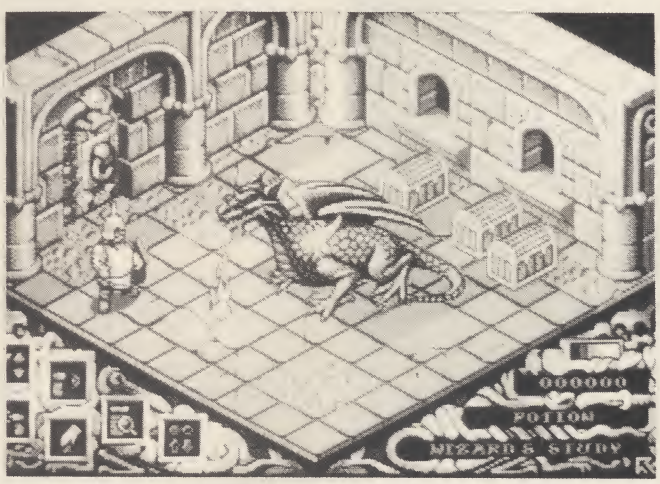
The New Year's Eve celebrations in 1999 could be very expensive for computer users, according to a report in the trade magazine *Computer Weekly*.

It appears that many pieces of computer software are only designed for 20th Century dates, and will not be able to cope with the new millennium.

Particularly badly afflicted are Unix systems, as the log-in procedure assumes that the century hasn't changed, and all the date functions automatically add the19.

System back-ups may also be a problem as software will often see the switch from 99 to 00 as going back in time. The international bill to fix affected software could be billions of pounds. ■

Bitmaps' Speedball sequel



• *Cadaver on the ST: a departure for the Bitmaps*

More details of the Bitmap Brothers' next arcade-style game (*Express* 63) have emerged this week.

The game, which will be released in the early autumn, will be a follow-up to the highly-successful *Speedball*. New features are being added to the game, including a much enlarged playing area and a greater choice of weapons.

The game will be available from Imageworks on 16-bit formats only.

Meanwhile work is progressing on *Cadaver*, the Bitmaps' move into adventure-style games. The title will be available in the summer, also on 16-bit only.

To cope with the work on these games, together with the development of a third project due by next winter, four more programmers and graphic artists have been recruited to the Bitmaps Brothers' team.

No details of the mysterious 'third project' are available.

The Bitmap Brothers have a string of hit games to their name, the most recent being the top-selling shoot-'em-up *Xenon II*, which topped the charts for the ST and Amiga. ■

Joystick frenzy

Veteran joystick manufacturer Spectravideo is promising wagglers everywhere a gaggle of new sticks over the next few months.

The firm has signed up 'exclusive rights' for the existing Quickshot range of joysticks – and there are a lot of them. By the end of this year we are promised a complete range of 15 weird and wonderful game-controlling creations in a variety of colours.

Spectravideo sales director Richard Sekular reckons his new line-up of controllers will be "The ultimate joystick range in the UK." ■

• *Quickjoy: lots of new ones*

Pretty as a picture

Do you love your computer? How would you like an oil painting of your machine to be hanging on the wall?

The Bangor-based Abstract Art Foundation has set up a new scheme whereby computer owners can buy an oil painting of their machine. It costs about £60 and all you need do is send in a photograph of the machine.

Organiser David Phillips said: "I've got an Amiga and I thought it would be a novel idea. I think it will take off." A £20 deposit is required, and painting and delivery takes about four weeks. Write to The Abstract Art Foundation. 7 Robinson Way, Bangor, County Down BT19 2NR. ■

• CPC: upgrade path opens

Back-door CPC upgrade

Stocks of the elusive chip needed to upgrade the Amstrad CPC464 to the more versatile 6128 have arrived in the UK.

Sales of the chip – coded Amstrad 40025 – had been stopped following a dispute between Locomotive Software and Amstrad over the rights to royalties. Amstrad had also expressed concern that it had been used as an upgrade path rather than as a simple replacement for faulty chips (*Express* 62).

Now, Barrow-based Wave says it has received "about thousand of them". Boss Mark Ralph refused to say where they had been sourced but stressed that they are official Amstrad chips. They cost about £20.

Call 0229 870000. ■

BBC programme was biased, says Commodore

COMPUTER ADDICTS TV SHOW SLAMMED

Commodore UK boss Steve Franklin has slammed the BBC's documentary programme on computer addiction as "biased".

The *QED* documentary, which was broadcast on January 17, sought to investigate the growing problem of people completely reliant on their computers at the expense of normal social contact.

It focused on one 13-year-old boy who had spent more then 30 hours a week playing Nintendo games before being cured.

Franklin said the role of computers had been "badly stated". The programme focused a great deal on the more violent type of games being played on arcade machines rather than personal computers, although the implication was that the programme was about computers.

He went on to claim that, over the Christmas period, Commodore had sold 250,000 "real computers which are now being used by youngsters at home". He said: "They were sold with associated software of an educational nature, indeed, many were sold without any games software at all.

"The role of computers in education was badly stated. The role of the computer as an aid to teaching the new National Curriculum was completely ignored. The emphasis was largely on experience in the US which is not entirely relevant to the UK.

"Parents need to appreciate that computers can also help their children learn more easily and express themselves fully. Without doubt, computers will be an important everyday feature in the lives of today's younger generation and the BBC's *QED* programme will have given their parents a very biased and alarmist picture." ■

• *Franklin:* QED was biased

IF YOU WANT BLOOD...

• *Psygnosis has released the PC version of the hit shoot-'em-up* Blood Money. *The title was hailed as an instant classic when it was issued on the ST and Amiga. The object of the game is to collect money to buy weapons, so you can get more money, so you can buy... you get the idea. The game is available now for £24.95, but Amstrad 1512 owners shouldn't get excited as it requires EGA or VGA and 640K to run.* ■

A puzzling time on a PCW

These days we are spoilt for choice of slick games with flashy graphics, so it makes a pleasant change to hear of a simple program with a hefty challenge.

***Pattern Puzzles* is the computer equivalent of those 3 x 3 plastic sliding squares with a jumbled picture on them. You have to restore order to the screen, which is not as easy as it sounds.**

The program is available for the PC (priced at £17.25), PCW (£13.80) and CPC (£11.50). For more details contact the publisher HTB Computers on 0794 516279. ■

Called off

Millions of telephones were rendered virtually useless in the US last week as one of the world's most sophisticated computer systems broke down.

A central software system run by AT&T was unworkable for nine hours, blocking off millions of telephone trunk lines across the US.

AT&T, which has trumpeted its system as the best in the world, is not ruling out the possibility of a computer virus fouling up the system. ■

Commodore 386

As was widely expected, Commodore has launched itself into the world of top end PCs with a 386 model.

The PC60-III runs at 25MHz and boasts up to 400Mb of storage with a total of nine expansion ports. There are three configurations of the machine with the lowest coming with 2Mb of memory and an internal 80Mb hard disk.

Retail prices for the range start at £4,070 rising to £5,499 for a 200Mb hard disk version. ■

The Speccy learns to sing

A three-part musical score writing program is to be launched for the Sinclair Spectrum 128.

Called *Music Writer*, it is aimed at budding musicians not familiar with music notation. Publisher Garry Rowland says anyone can write music with the program without any previous experience.

***Music Writer* includes all the extras required by musicians such as crescendo and diminuendo, and full notation and it runs under a simple WIMP-style environment. It will cost £19.95.**
Call 01-592 1874. ■

Special K breaks

There's a new version available of top-selling Atari ST spreadsheet *K-Spread*.

The original was launched in January 1986, and has proved to be a popular business program among ST users. The fourth version has more than 200 functions including statistics, trigonometry, string and data management, and error trapping.

There are also graphing and form-design features for simple viewing of accounts. Publisher Kuma says it's the ideal package for small businesses. Kuma produces an entire range of serious applications software.

K-Spread 4 costs £129 but reductions are available to upgraders. ■

Return of the killer ants

Sequels arrive more and more quickly these days – hot on the heels of *It Came from the Desert* is *It Came from the Desert II: Antheads*.

In this follow-up to the widely-acclaimed Fifties horror spin-off, some plutonium detonators have been stolen and taken to a deserted laboratory. The results, apparently, are blood-curdling.

The game requires the original to run, and will be available in February from Cinemareware for £14.99.

The original game is available for the Amiga and requires a megabyte of memory to run. ■

Barclays bug hits bills

A bug in Barclaycard's computer software has resulted in millions of Visa card owners receiving confusing statements this month.

The bug affected all transactions on December 15 and resulted in the loss of the transaction data – all purchases on that date are listed just as "Purchase in UK", with no further details.

Barclaycard says that it is the first bug of its kind to hit the system in 25 years of operation. ■

Security week

Joining the likes of Plant a Tree Week, the week ending on March 16 has been declared the International Week of Computer and Communications Security.

The world-wide event coincides with the Securicom '90, the 8th congress on computer security, and Infosec, the first European trade show on the subject.

Both events will take place in Paris. More information the shows cam be obtained on 010 33 1 4720 2122. ■

New generation computers will be based on proteins

UK SCIENTISTS WORK ON FIRST BIO CHIP

Scientists working for the Science and Engineering Research Council have outlined a programme for moving into the next generation of information technology based on molecular computing.

The council says that although this will mean working with the smallest possible elements, it signals the way forward in processing. They predict that ordinary silicon will be seen as cumbersome in the years ahead.

At present research into bio-computing is still in its infancy, and although the scientific community has long been making broad predictions about this mysterious area, little has been achieved.

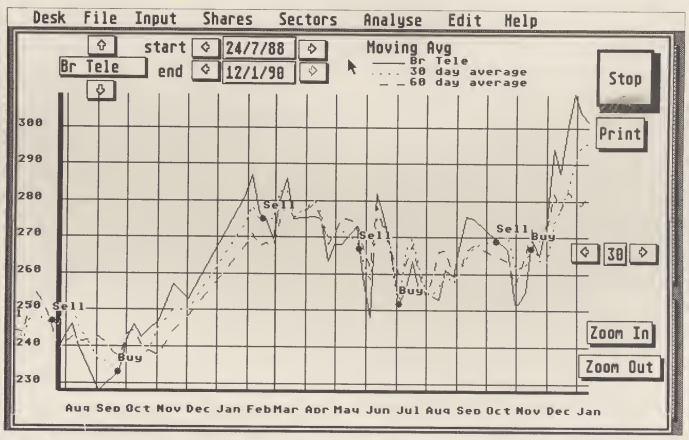
At a Royal Society meeting the British scientists hoped to lay down a concrete agenda leading to short term goals over the next five years.

"Molecular computing will be as different to silicon as silicon is to valves," said the council's co-ordinator, Professor David Bloor. "We want to stimulate the researchers who have the potential to accelerate progress to take an interest in molecular scale technology."

They hope to be able to devise a way not only of making molecular computing a reality but also make it interactive with silicon technology. "We can't overthrow the present system overnight," Bloor told *Express*.

He says that the world of biology has much to offer, with tiny synthetic proteins acting as natural switches which could control the flow of electrons.

In simple terms, computer chips would be up to one thousand times smaller than their current size, and therefore operate many times faster. ■



• **Market Breaker** *allows you to keep a track of your portfolio and watch the market for good buys with continuous updating via Ceefax.*

ST shares system keeps a watch on your stocks

ST owners can keep an eye on their Stock Exchange portfolio automatically with a new system from Jewsbury Software.

The program, *Market Breaker*, is distributed by Microtext and uses its teletext adapter to download stock market information directly from Ceefax and Oracle. The prices can then be analysed and displayed as graphs.

Market Breaker has information on share prices going back to the crash of October 1987, so any trend will be instantly visible. The details of a portfolio can be entered, and the system will watch the prices and report on profits and losses.

Five different graphical analyses are possible, and the entire market can be studied, or it can be broken down by financial sector.

The program can calculate running averages, which give a smoothed indication of the performance of a stock.

One of the most useful features promises to be its trend analysis, which will predict the 10 best and 10 worst performing shares.

Market Breaker joins other software such as weather forecasters in using the Microtext teletext adapter to maintain an up-to-date record. As yet no-one has converted a pools predictor to the system.

Market Breaker costs £69.95, with the adapter a further £148.90. Data can be entered by hand if you do not have an adapter. Contact Microtext on 0705 595694. ■

Citizen offers help disk

Buyers of Citizen printers are being offered a handy extra for free.

A helpful utilities disk is being bundled in with the Citizen ProDot 24 printer which includes five PC programs.

These include a quick and easy way to set up the printer, and a way of understanding all the printer's options through the use of menu-driven programs. You can also customise character sets and design logos. The disks are designed to help users who find dip switches and printer drivers a daunting prospect.

The *ProDisk 24* is available in either 5.25-inch and 3.5-inch formats. The ProDot printer, a fast 24-pin model, costs £599. ■

YS bought

Top selling Spectrum magazine *Your Sinclair* has been bought by Future Publishing.

It joins Future's stable of eight market-leading computer magazines including *New Computer Express*. *YS* had been set up by Dennis Publishing four years ago, and has become the biggest selling of the three Spectrum magazines.

New publisher Greg Ingham enthused: "It's a tremendous title and we've got some bold plans lined up. People have a tendency to concentrate on the next big thing, but at £150 the price of the Spectrum makes it a great option"

COMMENT

The BBC's documentary on computer addiction painted a distorted picture of the problem and failed to come up with a real solution

Here we go again. Last week BBC1's *QED* series screened a programme on the dangers of computer addiction. It focused on an unfortunate 13-year-old who had spent 30 hours a week playing Nintendo games, and the story of his weaning from this wretched habit. Others involved included grown men who stayed up all night playing *Shades*, and a 'computer widow', plainly baffled at her husband's openly-admitted preference for a computer.

Parents who had bought their offspring Amigas and STs as Christmas presents in the belief they were helping their schooling must have come away ridden with guilt and panicking that the new technology was about to kidnap their children: Atari Ate My Baby, as the *Sport* might put it.

It was, however, a programme from which no-one emerged with credibility intact. The fact that it was independently produced (by Kate Woods) should not detract from the BBC's responsibility to its audience. For this was without doubt one of the most irresponsibly alarmist and lamentably ill-judged 'documentaries' of recent memory.

It was hopelessly lacking in direction and intellectual rigour, hopping about from ill-informed paranoia about 'computer addiction' – itself a highly questionable label – to second-hand and unsupported observations about the dangers of violent interactive computer games, risibly mismanaged vox pops from the Personal Computer Show and bizarrely inept digressions about Logo and networking.

EXTRAORDINARY

Worst of all was an extraordinary interview with Margaret Shotton, whose book, *Computer Addiction? A study of computer dependency,* is a serious attempt to understand the causes and implications of this new phenomenon.

Ms Shotton was certainly ill advised to appear on the programme, for it did her no favours at all. *QED,* it appeared, felt obliged to consult an acknowledged expert on the subject, but unfortunately felt no responsibility for presenting her argument fairly. She was, for example, introduced as being apparently unconcerned about the dangers, which is a grossly unfair misrepresentation of her position. Anyone who saw that programme and has not had the opportunity to read her book must be under the mistaken impression that her appearance meant that she approved of the result. And of course she had no control over her contribution, nor indeed any opportunity to put the record straight. It was noticeable, for example, that she was not present – and presumably not invited – to the discussion on the following morning's edition of *Open Air*, though she did voice some of her objections by phone.

What research there was in the *QED* programme appears to have consisted mainly of referring as frequently as possible to the Massachusetts Institute of Technology. Ms Shotton conducted her research while based at Loughborough University, but perhaps that didn't convey the correct authoritative impression.

METHOD

It is worthwhile briefly summing up Margaret Shotton's methods and results, if only because, late as it is, this probably constitutes the only opportunity there will be to put the record straight. Shotton contacted 180 self-confessed 'computer junkies' through press, magazine and radio reports and computer networks. Of these, some 75 stayed the full course and returned a series of six questionnaires, giving what she acknowledges is hardly a representative sample (volunteers are by definition self-selected, for example), but which offers a far clearer picture of the typical computer dependent than the wilfully partial *QED* documentary. For balance she also used control groups consisting of non-dependent computer owners and non-computer owners.

And what Shotton found is that the computer dependents who replied to her questionnaires were surprisingly old (mean age 29.7 years), not surprisingly male (over 90 per cent), and much more intelligent than you might expect, with a very high level of educational qualifications. Of those over 20 years old, 80 per cent had at least one A-level, and 31 per cent held degrees.

RELATIONSHIPS

The subjects of her study do, as *QED* intimated, seem to have difficulties with human relationships: people are described by them as difficult to control and understand, while computers are easy. Computer dependents often graduate to their current obsession from another, suggesting if not an inherited then certainly an inherent characteristic, rather than the more comforting image of the trapped victim.

Such people enjoy their 'addiction' (an emotive term Shotton in any case rejects), and although their spouses express a wish that they would cut down, they themselves complain that there aren't enough hours in the day!

And although *QED* treated the 13-year-old "victim" as a self-contained unit – a kid with a problem – this entirely ignores Shotton's more convincing explanation of the causes of dependency. In most cases she found a male, middle-class child who was responding to internal family pressures. Offered love on condition that he succeeds, the child often withdraws from complex personal relationships and develops a kinship with a safe, predictable and uncritical computer.

DISEASE

Seeking to wean him from his dependency without solving the underlying problems is akin to force-feeding anorexics: it treats the symptom, not the disease.

Such people tend to choose the computer as an escape from people and social demands. They may be introverted, detached from others, awkward on social occasions unless role-playing (Shotton finds an unexpected liking for amateur dramatics in such people), self-sufficient, focused inwards rather than outwards and taking refuge in intellectual rather than social pursuits. There is some suggestion that such characteristics are related to a childhood lack of security due to love being offered conditionally, as a reward rather than as a parent's unquestioning acceptance of the child.

CRITICAL

Although all this sounds highly critical, suggesting that the computer junkie is a socially inept male finding solace in the silicon world, Shotton's conclusion, unlike *QED*'s, is far from pessimistic.

After all, the characteristics of the computer dependent show striking similarities with those of great artists, musicians and scientists: single-minded dedication bordering on (and often becoming) obsession; impatience with those not similarly blessed/afflicted; delight in the medium; and difficulties in making and maintaining 'normal' human relationships.

Backgrounds similar to computer dependents, she suggests, "full of shyness and isolation, may lead to the developments of wondrous inventions and ideas." Much better, then, Shotton concludes, to encourage and develop these odd, introverted, individuals than to attempt to wean them. Deprive them of their computers and they do not suddenly become 'normal' – they simply become special people deprived of what makes them different.

Shotton's work may be more convincing than the rampant technophobia of the *QED* programme and its producer Kate Woods, but unfortunately it's not good television. It's a little too complex and "woolly" for a one-off light entertainment; it won't generate media interest; it won't have parents running around in headless chicken mode; and it won't make Commodore's boss issue irate press releases.

Sometimes the trouble with truth is not that it hurts, but that it just doesn't hurt enough. ■

Express *welcomes your views on the issues raised in Comment or any other part of the magazine. Write to:*

Express Mail, New Computer Express, *Beauford Court, 30 Monmouth Street, Bath BA1 2AP.*
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EXPRESS

EDITOR • Martyn Lester
FEATURES EDITOR • Andy Storer
NEWS EDITOR • Colin Campbell

CONTRIBUTORS
Rob Ainsley • Jerry Glenwright • Maff Evans
Steve Carey • Simon Williams • Robin Alway
Andrew Brown • Keith Neal • Edmund Blake •
Jason Holborn • Bertram Carrot • Rod Lawton •
John Torofex • Pete Gerrard • Mark Higham

ART EDITOR • Angela Neal
PRODUCTION EDITOR • Stuart Anderton
DEPUTY PRODUCTION EDITOR • Ben Feinbaum

ADVERTISEMENT MANAGER • Mark Salmon
DEPUTY AD MANAGER • Adrian Taylor
AD EXECUTIVES • Simon Moss • Helen Kirkhope
ADMIN CO-ORDINATOR • James Leach
AD PRODUCTION • Frances Wasem
AD TYPESETTING • Terry Turner

PUBLISHER • Greg Ingham
MANAGING DIRECTOR • Chris Anderson

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PC

THE TALE OF THE NEW, IMPROVED PC PAINTBRUSH

The latest version of *PC Paintbrush*, the paint program from ZSoft which is bundled with every Microsoft Mouse, is surely a 16-colour product.

Although it has a 256-colour mode for psychodelia freaks, the low-resolution (320 x 200) screen has been done no justice by the program.

The character set used for all messages and menus is hideous, and such care has been put into the design of the toolbox icons, that it is with a sigh of relief that you leave the program's visuals behind.

The drawing screen size is severely limited by the tool box and palette displays, and though you can remove them, it then becomes increasingly hard to do anything with the program.

In 16-colour mode, with the full VGA resolution of 640 x 480 pixels, things look a lot smarter.

The trouble is that you cannot draw a complete screen at this resolution, as a 640K machine – even with a full half-megabyte of EMS memory – is still very much too small.

ANOTHER SAMPLE HEADLINE

While tinkering with Windows recently (see the panel on Font Installation on the right), and while I was waiting for a sample piece of text to print, and waiting and waiting and waiting, I was inspired to do a few tests on the actual time it takes Windows to put toner to paper.

I created a Windows *Write* document consisting of just three innocuous, but worthwhile words 'ANOTHER SAMPLE HEADLINE' and then changed this banner to 36-point *Typografica* Serif font.

It took 2:10.17 (that's two minutes, ten point one seven seconds) to print from a 25MHz Datamation 386 to a Hewlett-Packard LaserJet Series II with 1.5Mb of memory on board. Yes, I know it's hard to credit.

I then tried it under *Timeworks DTP*, which of course uses GEM for its input/output control. Result – 30.22 seconds – over four times as fast. OK, I know GEM doesn't multi-task, but then Windows wasn't multi-tasking in this test – and GEM doesn't make use of the half-megabyte RAM cache that Windows has at its disposal.

To complete the test, I created a Hewlett-Packard soft font, downloaded it to the printer and then used a word processor to output the same text again (this is a great way of decimating the fir forests of Sweden, children, so don't try it at home).

It took 22 seconds to download the font and 18 to print the file. The font download, of course, only has to be done one time for each font, so a multi-page document would print more quickly per page.

The outcome of this bit of stopwatchery is that Windows really does seem to be as slow as its detractors say it is. Perhaps Version 3 (expected some time in the late spring) will do something about this.

THE UP SIDE

From most of the above, you might feel I have a complete downer on the Microsoft Corporation. This is a long way from the truth.

I think the Microsoft mouse is the best mouse on the market, and not just because it doesn't have to emulate another. I also think Microsoft *Word* is a good word processor, only losing out to *WordStar* and *WordPerfect* because they had a head start – a head start which is quickly shortening.

Most in the know (not me – I don't use one) think Microsoft *Excel* is a good spreadsheet and a strong contender for Lotus *1-2-3*'s number one position. I will also go on record as saying that MS-DOS is a good operating system, at least up to version 3.3.

I do feel, though, that the company suffers more than most from the 'write it as a team' syndrome, which tends to make for heavily-structured and bulky code. And as we have seen, the more bulk in the raw code, the slower the software tends to run.

SUPPORTING MICROSOFT

Browsing through the trade press the other day, I came across an advertisement for Applications Support staff based at the headquarters of Microsoft in Reading, Berkshire.

For the fun of helping out clients with *Microsoft Word*, *Excel* and Windows (there it is again), the company is prepared to offer the attractive remunerative sum of £12K-£15K per annum.

Perhaps the South East isn't as alluring as it was, or perhaps candidates are simply meant to be so delighted with the idea of working for Big Bill Gates' little UK-emporium that any money at all is a mere bonus.

Simon Williams

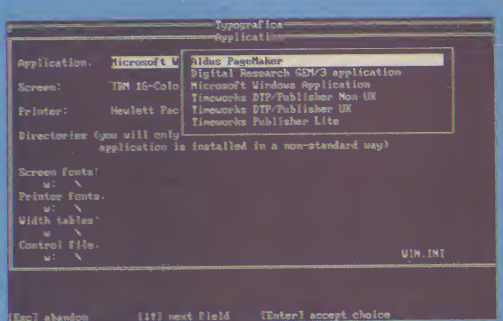
LARGE CHIPS, PLEASE

The Intel 80486 is so quick it drives PCs some two or three times faster than the humble Datamation 386.

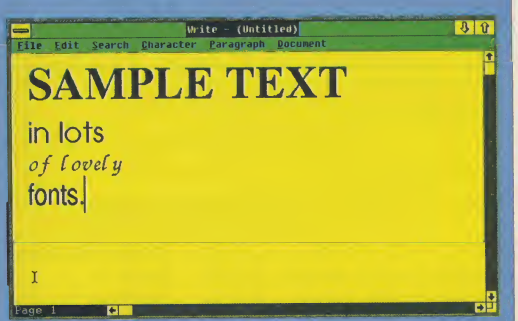
Announced last autumn with a fanfare, it has mostly surfaced in highly expensive machines from the likes of Compaq, Advanced Logic Research and IBM.

The British Education and Technology Training Show last week saw the launch of two 'budget' 486s, however, both from British companies. The first is the Viglen Vig IV which comes with 4Mb of RAM and a 110Mb hard disk. It costs from £4,699 with details available on 01-843 9903. The second is from Elonex, which is on 01-965 3225, and has systems available from 'under £4,000'!

SOME MORE DETAIL REGARDING FONT INSTALLATION



• *Select the right application in a package like Typographica...*



• *Then produce a whole range of fonts*

OK, last week was a bit of a cop-out. Those who really want to know how to install extra fonts into Microsoft Windows should read on for a step-by-step guide.

Using *Typografica* fonts, which are both economical and come with an excellent installation and generator utility, the procedure is as follows:

1. Install *Typografica* according to its own well-documented installation routine. Get it started and running.
2. From the main *Typografica* menu select [F3] to pick application, display and printer.
3. Select Microsoft Windows as the Application, and then choose the screen and printer which most closely match your set-up.
4. Then enter your principal Windows drive and directory as the selection for the screen fonts, for the printer fonts and for the width tables.
5. Enter the drive and directory which houses the Windows set-up file `WIN.INI` (which is usually called C:\WINDOWS), for the control file.
6. Return to the main menu and select [F4] to generate fonts.
7. Select the particular typeface that you want to use as the basis of your font.
8. Select the styles you want and 'Screen and Printer' as the device you want to generate fonts for.
9. Enter the point sizes of the fonts, separated by spaces, and any expansion/compression you want the font to have.
10. Press [F10] to start up the new font generation.

Typografica automatically generates the fonts, copies them into the specified directories and updates the `WIN.INI` file.

The next time you run Windows, the information in this file (which, incidentally, can be edited as ordinary ASCII text) is used to tell the program about the new fonts.

Now if you run a Windows application, like the Windows *Write* program which comes free with the Windows package, you can make full use of the newly-created fonts.

Windows *Write*, offers three fonts from its Character menu, but you can use any from the full range by selecting Fonts from the same menu.

A further selector box enables the choice of both typeface and size. The new font you make up then takes the place of one of the three 'shorthand' fonts.

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ARE YOU AN ST JUNKIE?

For most of us, our beloved ST is neither more nor less than something to do – a business aid or a way of impressing friends still getting by on an 8-bit machine. For a few, however, the computer assumes a much larger role than this, becoming not a good servant but a tyrannical master that just won't let the poor victim alone.

This subject has now become the object of some concern. The National Union of Teachers is reported to have issued a set of warning signs by which teachers can identify 'victims,' and last week's QED on BBC1 suggested that the problem is growing.

So this past weekend I have been reading Margaret Shotton's book, *Computer Addiction: A Study of Computer Dependency* (Taylor and Francis, £12.95). Shotton started her university research – which involved comparing 'computer junkies' with 'average' users and non-computer types – some five years ago, and the results make for fascinating reading.

The average age of the computer addict is somewhat older than I had expected – between 20 and 39, rather than in the teens as I occasionally encounter. Shotton even finds two victims over 60 years old!

Sad though these people are – lacking in friends and other interests – it seems there is little danger of most ST users suddenly developing this addiction. Apparently the majority of addicts – who seem, incidentally, to be of above average intelligence – were disturbed by childhood problems, such as being bullied at school.

Indeed Shotton claims that addicts generally come to computers after being passionately devoted to some other hobby, so that if they weren't stuck on computing they would be addicted to something else.

My own view is that such people do no harm (unless they ring you up when you're particularly busy), and are neither more nor less eccentric than football fans or avid readers, such as myself. If they're happy, what's the problem?

NEW RELEASES FROM SIERRA

Sierra, the American master-creator of adventure games has not been idle, and the results of its labours will shortly be seen, thanks to UK distributor Activision.

First out of the blocks is to be *Hero's Quest*, which will arrive with the claim that it is a 'totally new type of game,' though the presence of dragons, goblins, brigands and evil monsters should be enough to reassure the most conservative of adventurers.

The idea is that you choose what type of character you play, so that the adventure becomes a matter more of brawn than of brain if you're a macho, sword-wielding type; or a rather intellectual pursuit, should you be the type who eats a lot of fish, knocks off the *Times* crossword in 20 minutes and such-like.

A bonus in this method of devising a game with choice built-in is that you can replay it any number of times, adapting your character or adopting a completely new one. This is just as well, since *Hero's Quest* follows the usual Sierra route of, er, sophisticated pricing – £35 is not exactly budget software.

Also due from Sierra in the months to come is a 1920s Louisiana-set murder mystery entitled *The Colonel's Bequest*. Starring young student Laura Bow, the plot sounds like something straight out of Agatha Christie: a group gathers at lonely Gothic mansion, and when the corpses start piling up, influenza is not the suspected cause.

Finally, that tacky medallion-sporting star of the singles scene Leisure Suit Larry is back in *Leisure Suit Larry III, (or Passionate Patty in the Pursuit of Pulsating Pectorals)*. This time out, however, you can switch roles and become the delicious and unstoppable pleasure-seeking Patti – that far-from-obscure object of Larry's desire.

Special features in this newest Larry include an hour-long original music soundtrack, and some rather dodgy-sounding trivia-tested adult censorship grading levels. ST price is not yet set, but as a guideline the PC version is an eyewatering £45. Start saving now...

Incidentally, if you're an adventurer hopelessly stuck in some desperate situation you could always give 'The Guiding Light' a call. It's a telephone line operating from midday to midnight that can give you assistance with some 500 adventures. The only drawback is the cost: 38p a minute peak time, 25p at other times.

TOS UP: A BAD IDEA

The incredibly lucky Jerome Pimmel lives in St Peter Port on gorgeous Guernsey. He writes to tell me that his friend's uncle ordered a 520STFM and received a 520STE instead. Whoops!

Since he was ordering a 520, I take it that Jerome's friend's uncle is not one of those poor unfortunates who are upgrading to the STE only to find that much of their ST software collection won't run on the new machine. Want details? See *Express*'s news pages from this month.

Anyway, what Jerome wants to know is whether he could replace the current TOS on his own 520 with a blown copy of TOS 1.6, as found in the STE. I seem to recall there was no reason why TOS couldn't be upgraded to 1.4 in this way.

But I have grave doubts about doing this with the STE's TOS, precisely because of its upgraded hardware.

It is probable that TOS has been rewritten to expect a blitter, for instance. Put that version in a blitterless machine and you could well find yourself in trouble.

Steve Carey

JANUARY SALES

The Cyber range from Antic is just about the most comprehensive and sophisticated range of animation programs for the ST – or for any home micro for that matter. And considering how good they are, they've never been overpriced.

Now, however, the Cyber raange represents even better value. For Electric Distribution has announced sweeping price-cuts throughout the range.

***Cyber Studio*, for example, was previously £79.95 and it has been reduced by a whacking great £30;**

• Cyber Sculpt: *one of the good deals now on*

***Cyber Control* is down from £59.95 to £39.95; and *Cyber Paint* is now £49.95 instead of £69.95; while *Cyber Sculpt* is at £79.95.**

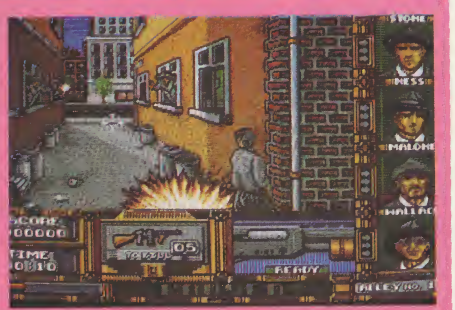
There are cuts of similar scale throughout a total of 14 Antic products, including *Spectrum, 3D Developers' Disk, Architectural Design, Human Forms, Video Titling, Genesis* and several more.

Furthermore, ED is cutting *Easy Draw 2* from £80 to £50, *Supercharged Easy Draw* from almost £100 to £80 and Timeworks' *Data Manager Professional* from £70 to £40.

So what on earth are you waiting for? Contact the good folks at Electric Distribution on 0480 496666 now!

ST GAME of the WEEK: THE UNTOUCHABLES

OCEAN • £24.99



Ocean did an excellent job translating the film *Batman* into an ST game, and now it has finished doing the same to that classic oldie-but-goodie, *The Untouchables*.

The game is set in 1920s Chicago when the infamous Al Capone and his henchmen are having a ball shooting up the town. Murder and mayhem is raging everywhere and you, as Elliot Ness, must go after Capone to make the streets safe.

The plot isn't particularly original, but at least the action sequences aren't just made up of one scrolling level after another. Instead *The Untouchables* is comprised of six levels.

The first sees you in a horizontally-scrolling section where the objective is to find Capone's bookkeepers by following an arrow at the top of the screen. Since they're constantly moving quickly around the level, you'll need to climb up onto crates and dodge Capone's henchmen fast if you want to get to level two.

Here, you're trying to thwart a liquor run by rolling along the ground and firing at Capone's men as they move the liquor. To reach level three, you must shoot the bottles standing on top of the crates.

In the alleyway sequence you must fire at Capone's men as they pop their heads through windows to shoot at you. Complete this level and it's onto the pram section, where you need to safely guide a baby carriage passed even more of Capone's men. Do they never die?

The fifth level has you trying to protect a hostage. Kill the henchmen quick and you'll get through to the final screen where you're chasing a hoodlum across the rooftops while Capone is in the courtroom underneath. If you can kill the hoodlum, Capone will go to jail.

The six levels are all different, which goes a long way towards sustaining your interest. The character sprites are some of the largest seen in an action game, and all the levels are colourful and well-defined.

With *Batman, The Untouchables* ranks as one of Ocean's best ST games to date. Let's hope 1990 sees even more of this type of quality release.

CHEATS NEVER PROSPER

INTERPHASE

Here are a couple of quick tips as discovered by M Simpson, a self-proclaimed Morpeth sleuth who manages to forge an identity even without the aid of a Christian name. Firstly, for the rather wonderful – if occasionally baffling – *Interphase*: when you're in the game, type FENNY.

You're then presented with a 'congratulations message'. Press the left mouse button and behold a series of 3D delights.

To zoom into an object, hold down the right mouse button and then push forwards. To exit, hold down the right mouse button and press the left.

ROADBLASTERS

Secondly, a cheat mode for *Roadblasters*. When the game has loaded, type "LAVIL-LASTRANGIATO" and you will have the following cheat functions:

Numbers 1 to 4= various weapons
S = finish current level
X = spin car
G = end game
F = extra fuel

If you've discovered any neat cheats for ST games, drop me a line and share the good news: write to Steve Carey, *New Computer Express*, Beauford Court, 30 Monmouth Street, Bath BA1 2AP.

AMIGA

CD ROM REVOLIUTION

If you bought an issue of *Express* last week, then no doubt you will have read with interest the cover story concerning Commodore's much-rumoured Amiga console that is supposedly based around the latest CD-ROM technology. This matter could do with a little cogitation.

If the Amiga console is to be a success, it must be backed up by the existing range of Amigas. Along these lines, Commodore in the States is trying to encourage software developers to produce CD-ROM versions of its games.

Unless early games sales are encouraging, however, the Amiga console could well be under serious threat when confronted by machines such as NEC's Super Graphyx and Sega's 16-bit Megadrive (an awesome bit of kit!).

• CD-ROM: set to be the next big thing on the Amiga?

To make the new CD-ROM technology more attractive to developers, it would therefore seem logical for Commodore to increase the potential market for Amiga console software by also launching its CD-ROM drive as a stand-alone unit for both the 500 and the 2000.

Commodore could then quite rightly justify making these drives available on the 'real' Amigas by encouraging their use within serious applications such as multimedia and the like.

The eventual release of the Amiga console will hopefully also mark the arrival of affordable CD-ROM technology on all Amigas, thereby putting the Amiga in a very strong position among top of the range PCs.

Oh well, my predictions don't always come true (but I've got a feeling about this one!). If it does come true, then I'll ask one of the *Express* layout artists to put the words 'TOLD YOU SO' in 100-point text across this page!

A500 PC EMULATOR ARRIVES

So you want to run PC software on your Amiga, right? What you need is a PC bridgeboard, an Amiga 2000 and a friendly bank manager, right? Wrong! Because the KCS Power PC board is almost here.

After having to look-on while Atari ST and Amiga 2000 owners enjoyed the mountain of software available for the PC computer, I can reveal – in an exclusive – that the Amiga 500 is soon to gain its very first hardware-based IBM PC emulator, courtesy of KCS in Germany.

How much for this board? Answer – £300 to you, matey!

The KCS Power PC board is a complete 'PC on a card' emulator that will

• Run PC software using the Power PC emulator board without an Amiga 2000!

allow A500 users to turn their machines into an 8MHz PC, complete with both MGA (Mono Graphics Adapter) and CGA (Colour Graphics Adapter) video support.

The board is based around the NEC V30 processor (as used by the Atari Supercharger PC emulator) and features its own memory and battery-backed clock.

To achieve the highest level of software compatibility, the Power PC board uses the most popular version of the MS-DOS BIOS, Pheonix BIOS.

For all you memory-starved Amiga owners, the board will also function as a half-megabyte RAM expansion board. This extra memory can be used by both the Amiga and the PC (when your machine is in emulation mode).

Although the board handles the tricky task of running PC software, all screen, port and disk drive handling is controlled by the Amiga. When the PC board wishes to talk to another one of these devices, the data is streamed out to the 68000, which then sends the data on to the desired channel.

A KCS spokesman claims that the technicians have got screen handling totally sussed, with the inclusion of ultra-fast text display and even full compatibility with programs that bypass the BIOS and hit the screen hardware directly.

According to KCS, the PC Power board treats all screen handling as 'direct screen I/O'; therefore, no amount of programming trickery and rule-breaking should cause the KCS board to fail.

Any MS-DOS emulator is useless unless you can direct read and write PC formatted disks with the host computer. But you've guessed it – KCS has even cracked this one: the Amiga drives are able to read PC-DOS and MS-DOS format floppies direct.

The KCS board will be marketed in this country by Bitcon Devices, who can be contacted on 091-490 1919.

Just as soon as Bitcon can rush me a review model, I'll bring you an update on how well this exciting device performs. You'll not only hear it here first, but you'll hear it here best as well!

PLAYING TIP

CHASE HQ

Pressing Turbo several times as you start driving sends the speed up to about 900kmph, and pressing Space repeatedly while the Music On/Off screen is on gives you free turbos.
John Briggs, Tyne and Wear

PEOPLE POWER!

After nearly five years, the machine that we have come to know and love has finally reached maturity. Just about anything you could possibly want to do on a computer can be achieved on the Amiga – for considerably less than other comparable machines.

There must, however, be programs or devices that you have seen on other machines that you wish were available for the Amiga. If there are, why not jot them down and send them in – who knows, perhaps some enterprising company may be reading this column and will take you up on your idea. To get the ball rolling, here's my Amiga 'wish list'.

A500 case converter. Let's face it – the Amiga 500 is an ugly beast. Wouldn't it be nice if a conversion kit was available to make it look more like its elegant big brother, the Amiga 2000?

Although the 500 arrives in a single case, the keyboard is actually separate from the rest of the computer. Bearing this in mind, it shouldn't be that hard to produce such a kit.

During the time I have spent as Technical Editor on *Amiga Format* magazine, many readers have asked for such a kit, but have been disappointed to learn that such a device does not exist.

Any company that choses to produce such an upgrade is almost certain to make a fortune. If and when, I'll expect a small payment for coming up with the idea, of course.

Route planner. During my time on *ST Amiga Format*, I had the good fortune to play with a program called *Auto-Route* from NextBase, which was sadly only available for Atari and PC. Although the company did not have any plans to produce an Amiga version, I'm sure that such a product would go down well among Amiga owners.

ST emulator. We've got a Mac emulator, a PC emulator, a C64 emulator and even a QL emulator – but where's the ST emulator? Surely an ST can't be more complicated than a Mac?

If such an emulator did exist, we could utilize all that music software (*Cubase*, *Virtuosa*, *Realtime* etc) without actually having to admit to wanting to use an ST. In other words, this would be an excellent way of getting the good bits without anyone being the wiser!

Jason Holborn

AMIGA GAME of the WEEK

PURSUIT TO EARTH

Exocet • £19.95

• Pursuit to Earth: not as good as it could be

Every so often a new company appears and surprises everyone with an amazing new product that becomes an instant success. Exocet is a new company under the wing of CRL, and it has released a new shoot-'em-up called *Pursuit to Earth*.

It is a surprising product, but, unfortunately, not in the way that we would have hoped. *Pursuit to Earth* has to be one of the top contenders for Turkey of the Year.

The plot is very similar to the archaic coin-op *Gyruss*, with aliens attacking the solar system and you having to travel around destroying their fleets.

But to be honest, it doesn't matter what the plot is here. It wouldn't be too bad if there was something to keep the player involved – but there's not.

***Pursuit to Earth* has but two things to recommend it: a spaceship that slows down horribly as soon as anything else appears on screen, and the same spaceship firing red dots at other wobbly-sprite spaceships as some white dots doing impressions of stars fly out at a distance.**

All this is backed with badly-sampled and derivative sound effects that wouldn't sound out of place in a game resembling the infamous *Space Invaders*.

It may seem like a waste of space to review a game this bad, but it is only fair to warn software shoppers who may be fooled by the nice packaging into believing that a decent game lies inside.

My advice to you is that you save disappointment and that you save money by avoiding *Pursuit to Earth* like the plague!

Maff Evans

SPECTRUM

WINDOWS ROLLED DOWN

I know I'm a bit late, and I know I don't score high for topicality, but *Chase HQ* and *Stunt Car Racer* are simply excellent. I probably don't need to tell you as the charts seem to suggest you've all bought a few copies each, and you no doubt spent the past few weeks playing the games to exhaustion.

I find it hard to contain my excitement. *Chase HQ* is one of the best arcade driving games on the Speccy ever, and *Stunt Car Racer*'s just a totally-addictive experience from start to finish or from start to half-way around when time runs out in my case.

If you buy these two and *Hard Drivin'*, you will then have in your possession the best driving games to date, bar none. Part exchange the family Lada if it comes to that.

OUT AND AROUND

Something has always struck me as being strange and unjust: the lack of public domain software for the Spectrum. Why do owners of 16-bit computers get vast amounts of free (or very cheap) PD software, whereas we less-well-off Speccy owners have hardly any?

This is positively unfair, I reckon. The good news is that there are now at least three libraries serving our machine (addresses below).

So, here's an update on Spectrum public domain, which, given enough response and PD contributions (to any of the libraries or send them to me at *Express*), will, I hope, be out of date in a few months.

Dave Gosnell's listings and ramblings have graced this column in *Express* in the past. Stricken by the sad and hopefully, er, I mean possibly, terminal illness of his Amiga, Dave decided to dig out the faithful old rubber key Speccy.

He then proceeded to get back to some proper computing by coding two excellent programs and chucking them on a tape together with an audio recording of an Amiga soundtrack the talented chap also wrote.

The first, *SpecTec*, is a successful attempt at recreating the impressive 16-bit style demos with a large scrolling message and colourful graphics.

Dave's other PD prog is called *Snake*, the age-old game, only this time it features beautifully-smooth graphics, good sound FX effect, and it proves more addictive than a lot of stuff costing a tenner and coming in boxes with Activision or US Gold written on them.

The audio extravaganza on the flip side of the C15 is the aforementioned Amiga-composed music and sounds pretty good if you don't mind feeling a tad envious.

Dave offers both progs on a 'public domain kind of basis' which means you're positively encouraged to pass copies onto friends/enemies/complete strangers as long as the copyright messages remains intact and any fee you charge isn't too excessive.

You can obtain Dave's PD tape for a pound (five 20-pence stamps if possible, or a cheque) and a blank C15 tape to Dave Gosnell, 40 Sixty Acres Road, Prestwood, Great Missenden, Bucks HP16 0PE. If you can't supply the magnetic media, Dave will for an extra 60p.

The other piece of Spectrum PD I've been sent recently is *Chordata*, a perfect example of the kind of non-commercial – but very useful – program that works as a PD product.

Chordata, by Dave Rogers, is a guitar chord finder which is capable of working out any chord you want to twang on your guitar. It should prove useful to would-be BB Kings.

Dave sent me the program to pass onto one of the PD outlets but as I don't want to be accused of favouritism, I'm willing to give a copy to any PD librarian who sends a blank tape and return postage to me c/o *Express*.

Anyone else who wants a copy is welcome to do the same, but you'd be much wiser to send an SAE for details to any of the Spectrum public domain suppliers if you want a speedier reply.

You may reach The Speccy Sector at 1 Roxwell Road, Chelmsford, Essex, CM1 2LY.

Write to Chezron Software at 605 Loughborough Road, Birstall, Leicester. LE4 4NJ. Not strictly a PD supplier, Chezron Software also publishes an excellent disc/tape mag with PD on it.

Contact the good people at Garner Designs, 57 Lovers Walk, Dunstable, Beds, LU5 4BG. This is also the address for the Plus 3 Users Group.

Robin Alway

A COUPLE OF QUICK POKES

Mark Taylor of Manchester offers these for *Fantasy World Dizzy*.

POKE	EFFECT
46194,120	Stops the bird flying
45448,218 45442,0 45433,0	Makes Amorog disappear (Go down to level, press fire when you go back it won't be there.)
44989,120 44994,0	Makes all fire disappear
45972,120 45952,120	Stops alligator mouth from moving
45690,218 45683,0 45677,0	Makes both dragons disappear. (Press fire on screen, take inventory back off and it vanishes.)

PCW

FIN-DE-SIECLE ZEITGEIST

Stop a Dutchwoman on the street and she can give you directions in excellent colloquial English; have a working lunch with a German businessman and he will fluently discuss matters in your tongue; meet a French person on a Paris boulevard and they can insult you effortlessly in your own language.

The British, on the other hand, are renowned as the world's worst linguists. And with 1992 on the way, it's time we did something about it.

Apex's Language Learning package claims to give you a good grounding in business and professional German, French, Spanish and Italian – on your PCW, of course – for £49.95. Business, technical, hotel and travelling situations are covered.

How effective the PCW can ever be at teaching a spoken language is open to question, but if you're interested, Apex is on 0273 727 477.

LOCOMOTIVE'S SECRET

Locomotive – the company which brings you *LocoScript* – clearly has no idea how a computer software outfit should be run. Unlike virtually every other company, it refuses to advertise – or even announce – new products until they're actually in saleable condition.

Further, Locomotive provides a technical support service consisting of a real person available at regular times instead of an answerphone in California, and it has a strange habit of leaving the one off the beginning of its prices, so that ordinary people can afford the products.

For journos the first point can be irritating; whatever happened to good honest hype a year before launch? Anyway, I'm sure Locomotive is up to something, even though it won't give me any clues. What could it be?

LocoSpread, a *LocoScript*-compatible spreadsheet to follow on from the success of the database, *LocoFile*? An ideas organiser to help you knock those concepts into shape before writing them up in *LocoScript*? A word counter, a complete font designer, or a thesaurus?

News when I have it, and meanwhile, watch out for a full report...

Rob Ainsley

TIPPING HERE

Even if your keyboard survives the coffee, tea and various other liquids that fly around your desktop, it can't escape the fingers of that bogeyman who sneaks in and types at your keyboard when you're not there, covering the keys gradually with a greasy brownish sludge. The answer is simple, says Elaine Bullard of Orkney: cover your keyboard with cling film from the kitchen.

MSX

PIONEER VOYAGING

I don't know how many Pioneer PX/7 owners read this column. I assume, though, that there must be a few, as this computer, although designed for video titling and superimposing via its built-in genlock, is still an MSX machine.

Indeed, packages created to make use of the PX7's capabilities have been few and far between. Therefore the latest from PRF Software should be of interest. *Video Titler* is a tape-based program that allows the user to construct a sequence of video titles of 256 lines, 32 characters in length.

As explained in the product literature, the user is able to tie any number of lines together to make pages. Further, each page can have lines moving in any of eight directions, with varying stop positions and differing pause times.

The manual then goes on to describe the program's in-built features and explains how to connect your video to the MSX computer.

The software is written in machine code, so it should run swiftly and smoothly. Also, according to the booklet, this program will work on any MSX computer, although, of course, you will not be able to use genlock to superimpose these images should you be in possession of a standard MSX machine. The software is priced at £24.99, and is I would think, very good value if you are a video enthusiast.

Unfortunately I received a faulty tape, and until I get a replacement, I am unable to try the package myself. Therefore I can't report on how good it is.

If you wish to wait until I have had hands on experience of the *Video Titler* before committing to a purchase, keep reading *Express*, otherwise PRF Software can be contacted at 26 Olton Road, Micklover, Derby DE3 5PL.

THE ELITE

At last someone has written in with tips for *Elite*, now my second favourite game. Barry Lynch from Tuam Co Galway, Ireland has sent in these goodies.

Type 6 to display local chart, lock on a planet within hyperspace range. Press H to begin countdown, then press G to display the Galactic map. Press F to find a planet as soon as countdown starts. Enter any planet in the Galaxy. When you come out of hyperspace you will be on that planet.

THE MISSING LINK

If you are wondering what has happened to the latest edition of the *Link* magazine, it will be a couple of weeks behind schedule, due to circumstances beyond the editor's control.

In fact, the editor, David Webb has a broken collarbone, sustained, not by his mother throwing his MSX computer at him, but because of an automobile accident. This proves beyond a shadow of a doubt that computing is safer than driving – well, at least a little.

Keith Neal

BBC

HUMBLE PIE

Usually I pride myself on keeping my ear close to the ground on Acorn matters. However, I do appear to have slipped up on at least one major new upgrade for the Master 128.

In my defence, the secrecy with which the new system ROM chip has been introduced is startling, even for Acorn. Although available since November, I have only just received a press release. So what is it? And does it justify the price tag of £39 which Acorn has slapped on it?

The new features provided by the ROM include: support for foreign and extended character sets, faster ADFS disk access, full use of the 6502 second processor, an Epson printer driver for View, and improved coding for some trigonometric and logarithmic functions.

For most users the only noticeable change in the ROM chip will be the speed of disk access, the rest of the advantages being mainly for use by software developers.

Further, the Master 128 ROM is soldered in place, so replacement is not for the faint of heart. Leave such things to the dealers would be my advice.

In conclusion, the ROM chip is for really for serious professionals only, unless you happen to be one of those people who just has to have the latest of anything and everything.

PERPLEXITY

I've just had my first look at *Perplexity*, which is the latest release from – well who else – but Superior.

Perplexity is a smooth-scrolling arcade game reminiscent both of the greats *Repton* and *Pacmania*.

The graphics in *Perplexity* are of the 'almost 3D' variety and they are very pleasant to look at, although they only occupy about half the screen area. To the top right is a map of the current level. Below this are various score and status indicators.

The scenario is familiar; you must push boulders together, thereby converting the rocks to edible diamonds. However, the actual gameplay is much more complex than my description would suggest. You have to be very careful to do things in the correct way, otherwise you will end up stuck in one part of the level.

Extra lives, bonus points and more time are just some of the goodies on offer – but avoid the monsters who kill on contact. The levels are also divided up into locked sections, which need the right type of key to open them.

Some of the later screens look particuarly daunting, and will need some thought before successful completion. All in all, *Perplexity* is an excellent – if slightly derivative – game.

TIP OF THE WEEK

My tip this week is for all you out there with keyboard troubles. Don't do as one person did, squirt Three-in-One oil into the mechanism, because this will just result in the whole keyboard sticking up with gunge.

If you have to do anything, try blowing some of the dust away using one of those dinky aerosols with which the professionals clean cameras.

Andrew Brown

CPC

NEW BALLS PLEASE

Winter is past (almost) and summer is on its way (we hope). Soon it'll be time to dig out the Slazenger, order the strawberries and trot down to the offie for the champers.

Don't know what I'm talking about? (You wouldn't be the first.) Wimbledon of course! That annual television showpiece where Des (I'm so cool I could drop dead) Lynham and Gerald (Who? What? When? Why?) Williams bring us another fortnight of torrential rain, tantrums and talk.

Which brings me (at last) to *Pro Tennis Tour* from UBI Soft. Wimbledon isn't the only venue visited during the game, you also get to tour the USA, Australia and France, but to us Brits, it's the only one that counts.

Your player, for once, is easy enough for even the most incompetent athlete to control. And if you don't fancy pitting your wits against either a computer opponent or a friend straight away, you can go into a practice mode where a little machine lobs an endless supply of balls at you. You can even practice your serve on an empty court if you wish.

Pro Tennis Tour costs £9.99 on cassette and £14.99 on disk. Find this game at any reputable dealer.

BOLT FROM THE BLUE

Firebird as a label may be on its last legs if Microprose goes ahead with its plans to rationalise its line-up (see *Express* 62), but if *P-47 Thunderbolt* is anything to go by, the label looks like it might be going out with a bang.

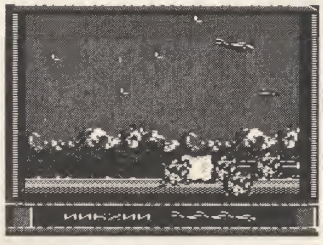
Mind you, the scenario's a bit dodgy right from the start. You're plonked in the seat of a WWII fighter, but the enemies you come up against on your airborne rampage are distinctly WWIII.

Helicopters are just one unlikely foe, but you'll also meet up with some extremely large, shiny and rapid missiles (both air-to-air and surface-to-air) that would make a V1 look like a milk float. More conventional foes on level one include an end-of-level train equipped with anti-aircraft guns, and on level two a large end-of-level bomber.

Your P-47 is viewed side-on, and the game is a pretty standard horizontal scroller. Where it excels, though, is at graphics. On all the levels the sprites are solid and attractive, and your aircraft banks as you change height – a nice touch.

The backgrounds, too, are highly attractive, with the cloudscape at sunset on level two being quite stunning. Explosions are exceptional as well, especially the sequence where the train on level one has finally soaked up too many bombs and goes up in one tremendous chain reaction.

Sound is OK – but nothing special.



• P-47: *Level one's monster train explosion*

When the fighting gets heavy, the individual effects merge into a constant drumming which sounds more like a shower of rain than the airborne armageddon in evidence on the screen.

Scrolling shoot-'em-ups are as old as the hills, and in that sense *P-47* adds nothing to the genre. Having said that, it's extremely playable, with attack patterns which are tough to start with but which can be analysed and then got around with practice. And, as I said, if *P-47* is Firebird's swansong, the label's going out with a bang...

REVIEW, ER, REVIEWED

Review is the name of a new fanzine being started up by none other than Simon Williams. OK, I can't tell a lie. It's not the Simon Williams of *Express*'s PC column fame, but a Simon Williams from Hednesford, Staffordshire.

Simon reckons he's not just a games addict, but that he uses his CPC for serious stuff too. He also reckons on becoming a journalist when he's finished his GCSEs, so *Review* should be pretty good training.

The first issue of *Review* has yet to be published, but according to the press pack I have in front of me (all very professional stuff) it's on its way very soon now. Contents will include news, letters, comms, a 'right to reply' section, homebrew software reviews, machine code lessons, technical tips (steady on, that sounds familiar), games reviews, serious reviews, adventure and hardware projects. All this for 50p plus postage.

If you want to find out more you can phone Simon on 05438 4813 or write to him at: 24 Chalcot Drive, Hednesford, Staffs WS12 4SF.

DESPERATE TIMES?

The following letter was sent to me by Michael Aidulis, who had this to say:

"I, like every other sentient CPC owner, am very worried that the Amiga and Atari ST monsters will swallow whole the lot of us. But I, unlike most of your 40,000 readers, have noticed that *AA* now realises the true depth of gravity in the situation.

"In January's edition there was a stark hardening of attitudes towards anything that was not an Amstrad. OK, fine, you can poke fun all you want at Specs and Comms, because these give a bad name to the word '8-bit' (hooray!), but to suggest that an Atari ST should be used as a wheel-chock (er, yes Steve, I can explain...) is funny, if utter nonsense.

"Everybody knows that its graphics are video-quality and some arcade coversions are identical to the real thing, not to mention sound. I see your slagging-off of this machine as a sign of desperation and you are trying all you know to prevent us from buying one.

"I do love my 6128, however, and I think the main reason for not buying an ST or Amiga is that the CPC is tried and tested and utterly faithful.

"You may say I am talking through a hole in my disk-drive, but I've seen it all before with poor old Dragon Data (to which I am also faithful), when *Dragon User* tried to fight two of the above micros single-handedly."

Rod Lawton

YOUR FORMAT

PC 10
ST 12
Amiga 13
Spectrum 14
PCW 14
MSX 14
BBC 15
CPC 15
Atari XE 18
QL 18
Archimedes 18
C64 18

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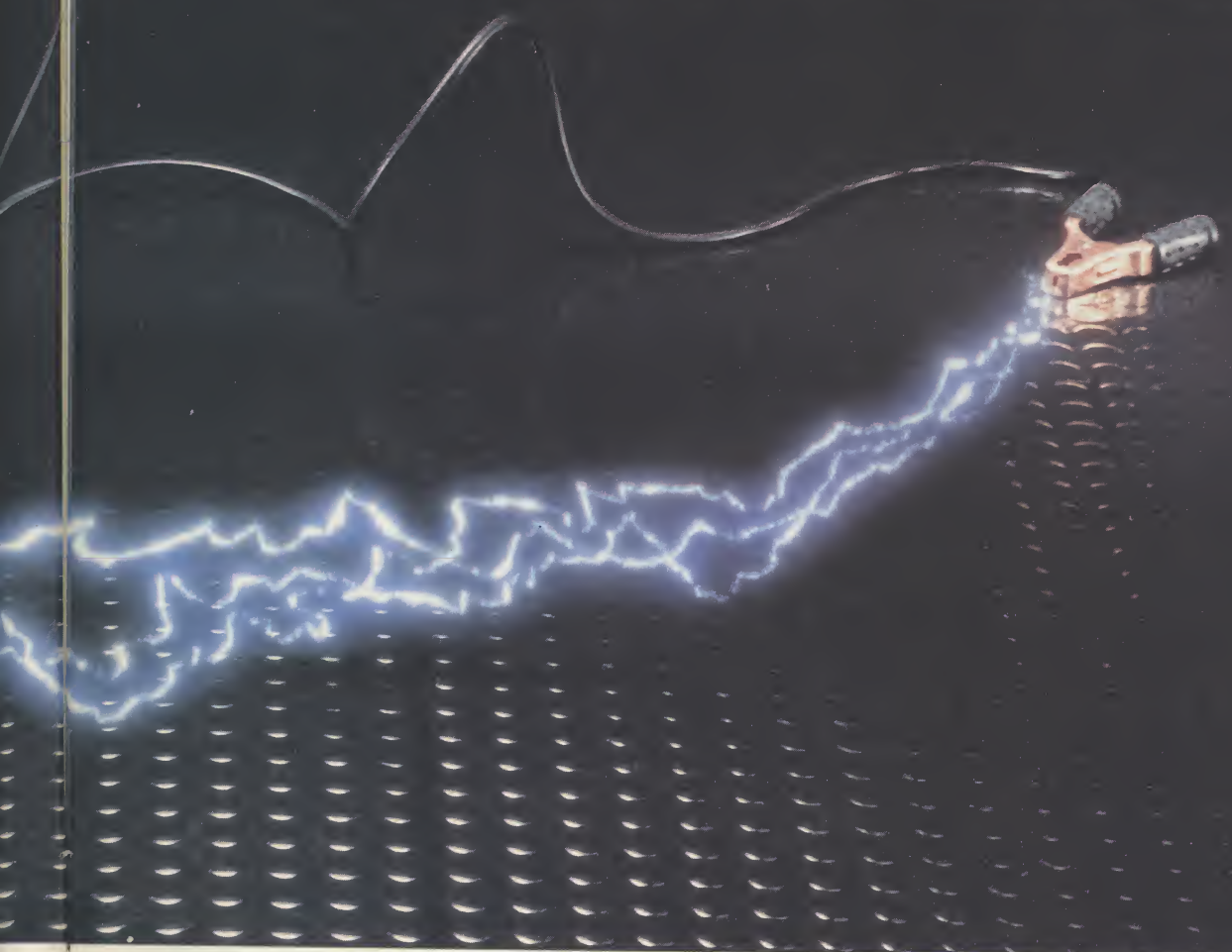

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QL

HAPPY BIRTHDAY

It is now six years since the QL was launched, although customers didn't get their machines for a couple of months after ordering – if they were lucky. Anyway, a rousing hip-hip-hooray to the QL!

Quanta, the independent QL users group, was formed at the same time (it was called IQLUG then), and it is still going strong, with around 2000 enthusiastic members.

Nigel Searle, Sinclair MD at the outset, was the victim of a practical joke perpetrated at the launch. Someone had carefully poured the contents of a jug of water into the cushion of his chair! And when he sat down...

John Torofex

CONTINUING INFORMATION ABOUT QDOS DISK FORMAT

As with the PC, tracks are numbered from zero, and sectors from one. All types of disk have the same directory structure with track zero containing the sector map. The first block of the map is sector 1, side 0, track 0. The first 96bytes of the sector map contain the format information:-

relative byte	size	notes
00	long	format ID (QLSA)
04-OD	12 bytes	medium name (space filled)
QE	word	random number set during format
10	long	update count
14	word	free sectors
16	word	good sectors
18	word	total sectors (sectors * tracks)
1A	word	sectors per tracke (<=9)
1E	word	number of tracks (<=80)
20	word	alloc size (sectors per alloc group)
22	word	block number of directory EOF
24	word	byte number of directory EOF
26	word	sector offset/track
28	18 bytes	logical to physical sector translate
3A	18 bytes	physical to logical sector translate
4C	20 bytes	spare

C64

LOSS OF MEMORY

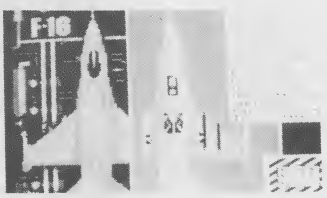
The engineer who came in response to my pleas charged me £10 for five minutes work and told me that my TV had suffered a loss of memory.

If you ever experience blank screens and nothing on channels 1 to 4, then you might save yourself grief by reading on. All that's wrong is the TV's loss of memory, so try re-tuning it. The channel numbers you're after are 57 for BBC1, 62 for BBC2, 59 for ITV and 65 for Channel 4. Don't forget the video recorder either, if you have one. It needs a channel number of 36.

I'M MANDY, FLY ME

Games lovers everywhere – good news. From January 31 you'll be able to spend £14.96 for a tape or £19.95 for a disk copy of *F-16 Combat Pilot*.

Digital Integration is the company to thank, and you may initiate contact at Watchmoor Trade Centre, Watchmoor Road, Camberley, Surrey GU15 3AJ.



• F-16: *try it, it flies*

LOADSA SOFTWARE

If you want to rapidly expand your software library without spending too much money, public domain software is the answer. Kingsway computer Services holds over 150 disks of the stuff. Write to the good folks at 140 Rushdale Road, Sheffield SS9 8QE, or telephone 0742 588429. Alternatively, send an SAE for a free catalogue – but don't forget to tell them it's the C64 one you want.

JUST POKEING ALONG

Some more fun POKEs for all you game players out there. On *Metocross*, `POKE 13501,234` and `POKE 13502,234` and `SYS 4076` to re-start with infinite time. On *Hectic*, `POKE 23392.76:POKE 23394,91` and `SYS 2217` to re-start with, you guessed it, infinite lives. Two for *Phobia* players next. `POKE 5390,198` (some of you may need to `POKE 5235,189` instead) and `SYS 2172` for infinite lives, or `SYS 2497` to see the end. Keep those hints coming in!.

HELP

Gareth Duffy would very much like some help as the hero Sir Arthur Pendragon in C64 game *Dragon's Skulle*. He wants to know how you "pick up the spade to get the cloak" as guards keep fighting him off. Any offers?

Pete Gerrard

XE

MENU DRIVEN

Transdisk from Digicom, is a versatile utility that enables cassette-based system owners who have recently acquired a disk drive (or those who want to buy the cheaper cassette software) to upgrade their software collection to disk quickly. The program takes account of the extra memory of the XE machine to make the back-up process easier.

Transdisk is entirely menu driven, enabling even the most hardened techno-phobes among you to use its many features. After booting up, you're presented with an opening menu. From here, you can examine the contents of disks 1 and 2, initialise a new disk, read a standard autobooting tape (or a non-stadard i.e. copy-protected tape), write a new disk file, append to an existing file or delete a disk file.

To start the process you must have an initialised disk in the drive. Selecting standard or non-standard cassette read will load the information contained on almost all commercial software tapes. Once loaded, the game can be written out to disk by selecting the write disk file option (append disk file, if the game is a non-standard, multi-load).

You must name the disk file with a OBJ extension in order to run it. Upgraded programs can be run by selecting them from a *Transdisk* menu.

Transdisk is available from Digicom, who can be contacted at 170 Bradwell Common Boulevard, Milton keynes, Bucks MK13 8BG. Tel: 0908 663708. See you next time.

Edmund Blake

ARCHIMEDES

FIRST THROUGH THE DOOR

More top class games are heading for the Arc. For a start, Arcana software is about to release *Rotor*, a game which must rate as one of the best yet.

The game has its origins in older games like *Thrust* and *Oids*, which themselves hark back to *Asteroids*. Not that *Rotor* has much to do with *Asteroids*.

The full-colour, circular ship in *Rotor* sails serenely through a contoured, smoothly-scrolling landscape absolutely chocked with alien defences.

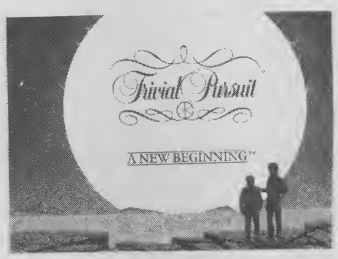
The idea of the game is to recover sun crystals from awkward points in increasingly complex mazes of tunnels and return those crystals to a specified place. In the process, you can earn yourself PUs to buy yourself into the next sector, and transformer steps to increase the armament of your ship.

The transformer is an on-board device which can provide increased manoeuvrability, extra hulls, fuel and several other useful gizmos.

As you shoot the pods which line the walls of the maze and collect their contents, you can advance from one transformer goody to the next – though you can only use one at a time.

Rotor is all about control, and as with *Zarch*, you need to learn this before getting into the heavy action. The game provides two simulators, with which you can practise many manoeuvres while gearing your conrol training towards the inevitability of combat.

Control passes through the three mouse buttons or selected keys on the keyboard, and the main problem is turning the ship fast enough to use the grapple at the back of your ship to grab the contents of a pod before you hit it.



• **Trivial Pursuit: *version II on some formats***

Graphics and sound make the game enjoyable, though the squelching noise of destroyed pods and defences is an odd choice. The real value of the game is in the gameplay, however.

There is a good deal of strategy involved in swinging your ship through the defences, and this challenge is well-combined with the need for arcade skills that few except *Elite* will demand.

Rotor is a must, and as such, it scores well into the nine hundreds on the Carrot Gauge of Late Night Play. You won't be disappointed if you try this one – that's a carrot guarantee!.

AND...

How many Archimedes owners does it take to change a lightbulb? Answer, written in a superior voice: Just as many as it would ST or Amiga owners, and it'll be done faster.

CLARES GETS ORGANISED

A new productivity program, *Knowledge Organiser*, hails from Clares, on 0606 48511. As something between a database and a computerised Filofax, the program pulls together summary details from just about any source.

Knowledge Organiser will work in conjunction with a Sinclair Z88 or you can transfer paper records to the system. Once in place, your valuable archives can be organised and sorted for display or print out. Priced at £59.95, it should be available any day now.

TP ON ARC

About games for the Arc: Domark has converted *Trivial Pursuit* for the machine. It follows the format of the earlier computer versions in having the added 'dimension' of TP, a fat squib with a big head, asking the questions. The game is true to the play of the board game, and the game works as well, if not better, on a micro.

This success is partly due to the added variety of picture and sound questions, but also to the analysis option, which points to the categories of question you're best at. This option can be quite a help if you play the game strategically or competitively.

Overall, this Archimedes version is a worthwhile *Trivial Pursuit* attempt, if you're into quizzes. It costs £19.95 and needs at least 1Mb of RAM.

Bertrum Carrot

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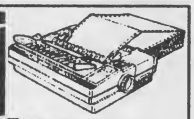

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4. The order including the voucher must be received by the advertiser before the closing date printed on the voucher.
5. You must fill in the details on the voucher.

THE SHOPPING EXPRESS BUYERS' GUIDE TO 50 TOP PCs

Looking for a PC? Let Express help you make the right choice. Here's a definitive list of the top 50 PCs on the market with the vital details on each.

Each PC is listed alphabetically, with the manufacturer's phone number and the recommended retail price. It is often possible to get a better deal than this, especially by mail order – check out the advertisements in this issue.

Below the price is the technical specification of that computer; which microprocessor it has, how much memory, what kind of graphics display it uses, which disk drive, what input and output ports it's supplied with and any extras the manufacturer throws in.

POWER RATING

We've worked out a power rating for each machine. Does it pack the punch you need? Anything under 50 is fine for most uses – word processing, running a club or small business, playing the odd game – while if you're after power computing you'll need a machine round the 100 mark. It's only a rough guide, of course, and only has a meaning relative to the other ratings. Check the tech specs to see if it'll do the specific things you need.

For the curious, here's how we worked out the power ratings. 386, 30 points; 286, 20 points; V20/40, 15 points; 86, 10 points; 88, 5 points; serial ports 2 points each parallel ports 2 points each; expansion slots 2 points each; 2.5Mb, 25 points; 2Mb, 20 points; 1Mb, 10 points; 640K, 8 points; 512K, 5 points; hard drive, 15 points; 3.5-inch disk, 10 points; 5.25-inch disk, 5 points: VGA, 20 points; EGA, 10 points; CGA, 5points.

DESIRABILITY RATING

There's also a desirability rating out of 100 – although the power rating is the most important, this indicates essentially 'how good' the machine is. This takes into account intangibles such as build quality and appearance as well as the perceived 'slickness' of the machine. Anything with single figures you'd be happy to get for Christmas but wouldn't walk down the road to buy. 30s and 40s would be worth a trip out of town to get. Anything over 90 and you'd sell your house and all its contents to buy one.

VALUE FOR MONEY

Finally there is the value for money rating. Measured out of five, the star rating indicates just how much computer you get for your pound.

● AMSTRAD PC1640

£499 • 0277 228888 • 8086 CPU (4.77/8MHz) • 640K RAM • EGA • 1 parallel port • 1 serial port • 3 expansion slots • 5.25-inch floppy • GEM • Mouse

Bottom of the – usable – range Amstrad PC. Plastic case of flimsy construction containing only three expansion slots and supporting a poor quality monitor which also houses the power supply (making it next to impossible to upgrade a mono system to colour). The package includes a GEM graphic operating system as well as MS-DOS and a mouse. Enjoys the somewhat ambiguous distinction of being cheap.

Power: 43
Desirability: 15

VALUE FOR MONEY: ★★★

● AMSTRAD PC2286

£999 • 0277 228888 • 80286 CPU • 1Mb RAM • VGA • 1 parallel port • 1 serial port • 5 expansion slots • 40Mb hard drive • mouse and bundled software

The Amstrad stab at high tech. Good quality VGA display let down by plastic machine with enormous footprint and slow hard drive. The machine is at least supplied with a reasonable – if not generous – supply of expansion slots.

Power: 79
Desirability: 50

VALUE FOR MONEY: ★★★

● APRICOT XEN-S PC

£1,495 • 021-456 1234 • 386SX CPU • 1Mb RAM • VGA • 1 parallel port • 2 serial ports • 3 expansion slots • 30Mb hard drive

Well-known for attempts at providing powerful computers, the XEN-S PC is Apricot's mid-range 386 machine. Reasonable construction, moderate keyboard but expensive.

Power: 87
Desirability: 60

VALUE FOR MONEY: ★★

● ARC PT88-1

£810 • 01-684 1948 • 8088 CPU • 640K RAM • CGA • 1 parallel port • 2 serial ports • 4 expansion slots • 5.25-inch floppy • paper-white monitor

ARC's bottom of range computer. A well made machine which, although expensive, comes with four expansion slots and a paper-white monitor.

Power: 37
Desirability: 20

VALUE FOR MONEY: ★★

● ARC PT 88-2

£1,140 • 01-684 1948 • 8088 CPU • 640K RAM • CGA • 1 parallel port • 2 serial ports • 4 expansion slots • 20Mb hard drive • paper-white monitor

One of a large range of PC compatibles from ARC, the PT88-2 is a well made computer which suffers from being a little expensive.

Power: 47
Desirability: 30

VALUE FOR MONEY: ★★

● ARC T304

£3,650 • 01-684 1948 • 80386 CPU • 2Mb RAM • VGA • 1 parallel port • 2 serial ports • 8 expansion slots • 40Mb hard drive (and twin floppies) • paper-white monitor

Starter computer for Arc's top the range machines, the T304 with 386 central processor, 40Mb hard drive and paper-white monitor is an excellent machine.

Power: 107
Desirability: 85

VALUE FOR MONEY: ★★★★

● ATARI PC3

£949.99 • 01 309 7770 • 8088 CPU • 640K RAM • EGA • 1 parallel port • 1 serial port • 4 expansion slots • 30Mb hard drive • mouse

Atari's foray into the PC compatible market opens with the PC3. Cheap, well made useable machine which commands consideration from anyone searching for a first PC with hard drive on a limited budget.

Power: 50
Desirability: 45

VALUE FOR MONEY: ★★★

● ATARI PC5

£2,799.99 • 01-309 7770 • 80386 CPU • 2Mb RAM • VGA • 1 parallel port • 1 serial port • 5 expansion slots • 60Mb hard drive (with high performance controller card) • 1.2Mb 5.25-inch floppy

The last word in PC power from Atari, the PC5 is aimed fairly and squarely at the 'power user'. Superior specifications and a very reasonable ➤

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Amiga Class of the 90's.....£449
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Amiga A501 RAM pack + Clock.....£99
Amiga joystick.....£10
TV Modulator.....£15
Phillips CM8833 colour monitor.....£199
Phillips BM7502 12" green monitor.....£79
Phillips BM7522 12" amber monitor.....£89
Amiga To Philips cable.....£8
Amiga RAM Upgrade.....£99
2 Meg RAM Upgrade, plus in board with on/off switch.

AMIGA DRIVE

1 Meg 3.5" external.....£68
1 Meg 3.5" internal.....£63
1 Meg 5.25" external.....£99

ATARI COMPUTERS

520 STE Power Pack.....£325
520 STE (Includes; Hype Draw, Hype Paint, ... Borodino)
520 STFM Explorer Pack.....£248
520 STFM Super Pack.....£329
520 STFM Power Pack,.....£322
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1040 STE.....£389
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REPAIRS FOR AMIGA AND ATARI

price ensures its success in the high-end market place.

Power: 99
Desirability: 75

VALUE FOR MONEY: ★★★★

● BROTHER BC10

£780 • 061-330 6531 • 8088 CPU • 640K RAM • CGA • 1 parallel port • 1 serial port • 4 expansion slots • 20Mb hard drive
Better known for quality printers, Brother's BC10 PC is an attempt to conquer the compatible market. Reasonable specifications and quality construction coupled with aggressive pricing gives the machine a head start in the market-place.

Power:45
Desirability: 38

VALUE FOR MONEY: ★★★

● COMMODORE PC10

£549 • 0628 770088 • 8088 CPU • 640K RAM • CGA • 1 parallel port • 1 serial port • 3 expansion slots • 5.25 floppy
Entry level PC compatible from home computer manufacturer Commodore. Well made, good keyboard but a little expensive.

Power:33
Desirability: 20

VALUE FOR MONEY: ★★★★

● COMMODORE PC 60-80

£2,999 • 0628 770088 • 80386 CPU • 2.5Mb RAM • VGA • 2 parallel ports • 2 serial ports • 8 expansion slots • 80Mb hard drive
Power computing for the people! The PC60-80 is one of the most powerful of the affordable 386 machines on the market. The computer is thoughtfully designed, well made and at this price, sports unbelievable potential.

Power: 114
Desirability: 95

VALUE FOR MONEY: ★★★★

● COMPAQ DESKPRO 286

£1,495 • 01-332 3000 • 80286 CPU • 640K RAM • VGA • 1 parallel port • 1 serial port • 7 slots • 20Mb hard drive • 1.2Mb floppy
Renowned for quality, powerful – if expensive – computers, the DeskPro 286 carries on the tradition of Compaq.

Power: 66
Desirability: 55

VALUE FOR MONEY: ★★★

● COMPAQ DESKPRO 386

£2195 • 01-332 3000 • 80386 CPU (20MHz) • 1Mb RAM • VGA • 1 parallel port • 1 serial port • 7 expansion slots • 20Mb hard drive • 1.2Mb floppy
Compaq's top of the range power computer. Highly desirable machine featuring a 20MHz 386 central processor, clean construction, good keyboard etc.

Power: 83
Desirability: 80

VALUE FOR MONEY: ★★★

● DELL SYSTEM 325

£5,699 • 0800 414535 • 80386 CPU • 1Mb RAM • VGA • 1 parallel port • 2 serial ports • no expansion slots • 320Mb hard drive
Dell is generally regarded as being the power computer manufacturer and the System 325 machine does nothing to dispel the fact. Powerful and with an enormous disk drive. A desire for power and bulging coffers are the necessary qualifications for this machine.

Power: 81
Desirability: 90

VALUE FOR MONEY: ★★★

● DOLAN XT

£634 • 0267 234444 • 8088 CPU • 640K • Hercules • 2 serial ports • 2 parallel ports • 8 expansion slots • 40Mb hard drive • bundled software
Cheap entry-level XT from Dolan. Very good value for money, with a paper-white monitor and fast hard drive. Recommended.

Power: 60
Desirability: 60

VALUE FOR MONEY: ★★★★★

● DOLAN 386

£995 • 0267 234444 • 80386SX CPU • 1Mb RAM • VGA • 2 serial ports • 2 parallel ports • 5 expansion slots • 20Mb hard drive • mouse, bundled software
High-spec Dolan 386 AT which includes a fast hard drive at an incredible price.

Power: 85
Desirability: 80

VALUE FOR MONEY: ★★★★★

● ELONEX PC 88-C

£695 • 01-965 3225 • V20 • 640K RAM • CGA • 1 parallel port • 1 serial port • 2 expansion slots • 20Mb hard drive • GEM, mouse
The PC 88-C is Elonex's entry level machine. Sporting a fast V20 processor and 20Mb hard drive for a miniscule £700 the machine deserves a place at the top of any budget PC shopping list. Well-made and reliable.

Power: 51
Desirability: 40

VALUE FOR MONEY: ★★★★

● ELONEX PC286S-120

£1495 • 01-965 3225 • 80286 CPU (12MHz) • 640K RAM • CGA • 1 parallel port • 2 serial ports • 3 expansion slots • 40Mb hard drive • GEM • mouse
Mid-range Elonex compatible featuring 40Mb hard drive and a small footprint.

Power: 58
Desirability: 40

VALUE FOR MONEY: ★★★★

● ELONEX PC 382S-200

£3095 • 01-965 3225 • 80386 CPU • 1MB RAM • VGA • 1 parallel port • 2 serial ports • 3 expansion slots • 320Mb hard drive • GEM, mouse
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Power: 87
Desirability: 75

VALUE FOR MONEY: ★★★

● EPSON PCE HD

£1,199 • 0442 61144 • 8088 CPU • 640K • CGA • 1 parallel port • 1 serial port • 3 expansion slots • 20Mb hard drive

Epson provided the industry standard for 9-pin printers and control codes but is not going to set any standards with the PCe. Expensive and under-powered – it's a dodo.

Power: 33
Desirability: 0

VALUE FOR MONEY: No stars

● EPSON AX FD

£1,599 • 0442 61144 • 80286 CPU • 640K • CGA • 1 parallel port • 1 serial port • 7 expansion slots • 5.25 floppy

Mid-range Epson 286-based PC. Incredibly overpriced.

Power: 51
Desirability: 2

VALUE FOR MONEY: ★

● EPSON AX80 HD

£2,499 (excl. monitor) • 0442 61144 • 80286 CPU • 640K • CGA • 1 parallel port • 1 serial port • 6 expansion slots • 80Mb hard drive

Ridiculously overpriced top of range computer from Epson. Price does not include a monitor (!).

Power: 64
Desirability: 0

VALUE FOR MONEY: ★

● IBM PS/2 30

£1,298 • 01-747 0747 • 8086 CPU • 640K RAM • EGA • 1 parallel port • 1 serial port • 3 expansion slots • 3.5 floppy

IBM's starter machine. Very well made, reliable and with the backing of Big Blue. Not cheap, but then the best always costs a little more, right?

Power: 48
Desirability: 75

VALUE FOR MONEY: ★★

● IBM PS/2 50

£2,389 • 01-747 0747 • 80286 CPU • 1MB RAM • VGA • 1 parallel port • 1 serial port • 3 expansion slots • 20Mb hard drive

From the company that started it all, the mid-range computer. All the superlatives associated with the model 30 and 10 times the desirability.

Power: 65
Desirability: 95

VALUE FOR MONEY: ★★

● IBM PS/2 80

£4,407 (from) • 01 747 0747 • 80386 CPU • 2MB RAM • VGA • 1 parallel port • 1 serial port • 7 expansion slots • 44-314Mb hard drive • 1.2 Mb floppy • floor standing

The computer from the computer company.

Power: 103
Desirability: 100

VALUE FOR MONEY: ★★

● NEC POWERMATE 1

£1,395 • 01-993 8111 • 80286 CPU • 640K RAM • VGA • 1 serial • 1 parallel • 6 expansion slots • 20Mb hard drive

NEC's entry level computer. Fast but expensive.

Power: 59
Desirability: 50

VALUE FOR MONEY: ★★★

● NEC POWERMATE 386 20

£5,895 (excl. monitor) • 01-993 8111 • 80386 CPU • 2Mb RAM • VGA 2 serial ports • 1 parallel port • 8 expansion slots • 300Mb hard drive

Top of range NEC 386-based machine. Vast power but an expensive buy.

Power: 95
Desirability: 65

VALUE FOR MONEY: ★★

● NESS AT-286 S

£1,195 • 01 806 1072 • 80286 CPU • 512K RAM • CGA • 2 parallel ports • 1 serial port • 5 expansion slots • 20Mb hard drive

Mid-range PC compatible notable only for its non-conformist specifications!

Power: 61
Desirability: 30

VALUE FOR MONEY: ★★

● OPUS PCIII SF TURBO

£549 • 0733 765080 • 8088 CPU • 256K RAM • CGA • 1 parallel port • 1 serial port • 7 expansion slots • 5.25 floppy

The UK's second largest PC compatible manufacturer (Amstrad being the first) Opus have a fine reputation for quality machines. The PCIII is ideal for use as a LAN terminal.

Power: 34
Desirability: 30

VALUE FOR MONEY: ★

● OPUS PC IV TURBO

£995 • 0733 765080 • 80C88 CPU • 768K RAM • CGA • 1 parallel port • 1 serial port • 2 expansion slots • 20Mb hard drive

Mid-range Opus machine which is reasonably priced but lacking in expansion options.

Power: 41
Desirability: 40

VALUE FOR MONEY: ★★

● OPUS PC VI TURBO

£1,295 (from) • 0733 765080 • 80286 CPU • 1Mb RAM • VGA • 1 parallel port • 1 serial port • 5 expansion slots • 60Mb hard drive • mouse port

Top of range computer from Opus featuring good specifications and a reasonable price.

Power: 79
Desirability: 65

VALUE FOR MONEY: ★★

● PHILIPS NMS 9115

£799 • 01-689 2166 • 8088 CPU • 640K RAM • EGA • 1 parallel port • 1 serial port • 4 expansion slots • 20Mb hard drive

Philips is a company with a ➤

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deservedly good reputation in the consumer electronics market place for good quality, reliable and well made equipment. The NMS 9115 is the mid-range PC compatible from the company, offering decent specifications and a moderate price, the machine is worth more than a cursory glance.

Power: 50
Desirability: 45

VALUE FOR MONEY: ★★★

● PHILIPS PC FAX 2

£1,049 • 01 689 2166 • 8088 CPU • 640K RAM • CGA • 1 parallel port • 1 serial port • 4 expansion slots • 20Mb hard drive • internal Fax card

The Philips PC Fax-2 offers the unusual add-on of a Fax card included in the price. An ideal computer for those concerned with communication as well as computing.

Power: 50
Desirability: 60

VALUE FOR MONEY: ★

● RSC 386T 20

£2,229 (from) • 0923 243301 • 80386 CPU • 2Mb RAM • EGA • 1 parallel port • 2 serial ports • 8 expansion slots • 40-122Mb hard drive

Top of the range 386 computer from relative newcomer RSC. Thoughtful design and quality construction guarantee the machine a share of the market.

Power: 97
Desirability: 75

VALUE FOR MONEY: ★★★

● SAMSUNG SPC 3000/2

£699 • 01-391 0168 • 8088 CPU • 640K RAM • CGA • 1 parallel port • 1 serial port • 7 expansion slots • 5.25 floppy

Entry-level PC compatible from Korean computer manufacturer Samsung. The SPC3000 offers a good range of expansion options, quality construction and reliability.

Power: 41
Desirability: 50

VALUE FOR MONEY: ★★

● SAMSUNG MFC 6000/2

£1499 • 01 391 0168 • 0168 • 80286 CPU • 1MB RAM • EGA • 1 parallel port • 1 serial port • 6 expansion slots • 20Mb hard drive • 1.2Mb sloppy

Samsung's attempt at attracting the power user, the MFC6000 computer is powerful and like all Samsung computers, well made and reliable.

Power: 45
Desirability: 47

VALUE FOR MONEY: ★★★

● SCHNEIDER EURO PC

£458.85 • 0604 766572 • 8088 CPU • 512K RAM • CGA • 1 parallel port • 1 serial port • 1 expansion slot • 3.5 floppy • bundled software

Entry-level PC compatible which breaks with the traditional '3 box' style of PC design and instead, includes motherboard and drive in the keyboard (similar to Atari ST and Commodore Amiga) – fine but where do you put expansion cards? There is one expansion port at the rear of the computer the use of which entails having your add-on hanging free at the exposed rear. Definitely for those with severely limited budgets (for another £50 you can have the Amstrad PC1640).

Power: 31
Desirability: 5

VALUE FOR MONEY: no stars

● SCHNEIDER TOWER AT

£799 (from) • 0604 766572 • 80286 CPU • 512K • EGA • 1 serial port • 1 parallel port • 5 expansion slots • 20Mb hard drive bundled software

The exact opposite of Schneider's other computer the Euro PC, the Tower AT is aimed at the power user with money to burn. The machine, however, offers reasonable specifications at a very moderate price and as such deserves your attention.

Power: 50
Desirability: 45

VALUE FOR MONEY: ★★★

● TANDON PCX20

£1,045 • 0572 46800 • 80C88 CPU • 640K RAM • CGA • 1 parallel port • 1 serial port • 5 expansion slots • 20Mb hard drive

Tandon is a computer manufacturer responsible for a large range of PC and AT compatibles. The PCX 20 is an entry level computer which is robust and fully featured – worthy of close examination for those looking for a first PC.

Power: 47
Desirability: 50

VALUE FOR MONEY: ★★★

● TANDON PAC286 1.2 PLUS

£1,688 • 0572 46800 • 80286 CPU • 1 Mb RAM • 1 parallel port • 1 serial port • 3 expansion slots • 20 Mb hard drive • 1.2Mb floppy

Mid-range 286-based AT compatible from Tandon featuring a high density floppy drive as standard. It is a little expensive.

Power: 65
Desirability: 55

VALUE FOR MONEY: ★★

● TANDON 382/20 110

£3,399 • 0572 46800 • 80386 CPU • 1 Mb RAM • VGA • 1 parallel port • 1 serial port • 5 expansion slots • 110 Mb hard drive • Microsoft windows

Top of range Tandon 386 featuring large capacity 110 megabyte hard drive, robust construction and reliability. This machine has everything you could ask of a PC compatible machine and has a price to match.

Power: 79
Desirability: 65

VALUE FOR MONEY: ★★★

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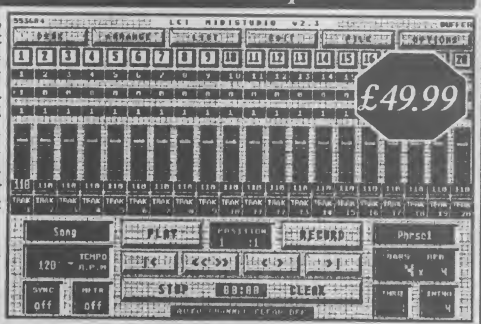

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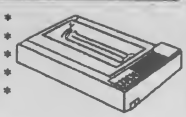

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* Deduct £10 if bought with computer, Scart cable included

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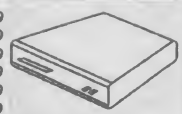

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520 STE Explorer	£279.99
520 STE Power pack	£369.99
1040 STE Hyper pack	£459.99
Amiga Class of 90's	£549.99
Amiga Batman pack	£369.99
Amiga Batman + pack	£399.99

Explorer pack includes a game, Metacomco Basic and tutorial disk.

Power pack consists of Organiser software, First Basic, First music and games including, Afterburner, R-Type, Gauntlet II, Super hangon, Space harrier, Mousetrap, Buggy boy, Super huey, Eliminator, Nebulus, Pacmania, Predator, Bombjack, Bombuzal, Xenon, Double dragon, Blacklamp, Outrun, Stargoose, Starray.

Hyper pack includes Hyper Paint art package, Hyper draw vector drawing package, Borodino strategy game and Metacomco Basic.

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● TANDY 1000SL

£695 (from) • 0922 710000 • 8086 CPU • 384K RAM • CGA • 1 parallel port • 1 serial port • 5 expansion slots • 20Mb hard drive

Tandy (AKA Radio Shack in the States) is a company with a large amount of experience in the electronics industry. Tandy has numerous outlets around the country and the person-power to cope with warranty repairs etc. Consequently Tandy PC compatibles are a surprisingly good buy if a little expensive. The 1000SL is an unusual looking entry level computer which suffers from a small RAM to large price ratio.

Power: 44
Desirability: 20

VALUE FOR MONEY: ★★★

● TANDY 5000MC

£4,995 • 0922 710000 • 80386 CPU • 2Mb RAM • EGA • 1 parallel port • 1 serial port • 10 expansion slots • 40Mb hard drive • bundled software

Fully-featured 386 computer from Tandy. A high quality of construction and plenty of expansion possibilities ensure the 5000MC a rosy future.

Power: 99
Desirability: 75

VALUE FOR MONEY: ★★

● VICTOR VPC11C

£1099 (from) • 0494 461600 • 8086 CPU • 640K RAM • CGA • 1 parallel port • 1 serial port • 3 expansion slots • 30-60Mb hard-drive

No frills PC compatible from relative new-comer Victor. The machine is well made, has a super keyboard and crisp display. A little expensive at £1100.

Power: 48
Desirability: 35

VALUE FOR MONEY: ★★★

● VICTOR V286S

£2499 • 0494 461600 • 80286 CPU • 1Mb hard drive • CGA • 1 parallel port • 1 serial port • 8 expansion slots • 40-130Mb hard drive

The V286S is the mid-range machine of the six machines currently marketed by Victor. This machine is rather expensive, but of reliable construction.

Power: 70
Desirability: 60

VALUE FOR MONEY: ★★

● VICTOR V386S

£3,999 • 0494 461600 • 80386 CPU • 2Mb RAM • 1 parallel port • 1 serial port • 8 expansion slots • 130Mb hard drive

Top of range 386-based computer from Victor. Expensive.

Power: 95
Desirability: 70

VALUE FOR MONEY: ★★★★

● VIGLEN VIG1

£789 • 01-843 9903 • V20 CPU • 640K RAM • CGA • 1 parallel port • 1 serial port • 5 expansion slots • 30Mb hard drive

The VIG 1 is an imaginatively titled entry-level computer from Viglen. Fully-featured and cheap, the machine deserves a second look.

Power: 57

Desirability: 50

VALUE FOR MONEY: ★★

● VIGLEN VIG1 PLUS

£1,189 • 01-843 9903 • 80286 CPU • 640K RAM • VGA • 1 parallel port • 1 serial port • 5 expansion slots • 30Mb hard drive

Mid-range 286 machine from Viglen labouring under the unfortunate name of VIG1 (sounds rather like a Gerry and Sylvia Anderson creation) which nonetheless is an excellent and cheap computer worthy of your attention.

Power: 77

Desirability: 70

VALUE FOR MONEY: ★★

● ZENITH EASY PC

£499 • 06286 68588 • V40 CPU • 512K RAM • CGA • 1 parallel port • 1 serial port • no expansion slots • 3.5 floppy

Vaunted as an entry level PC, but it doesn't cut the mustard..

Power: 29
Desirability: 5

VALUE FOR MONEY: no stars.

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3 1/2" DD/DS		
	JVC	£8.30
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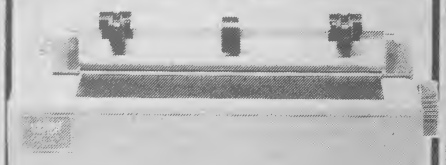

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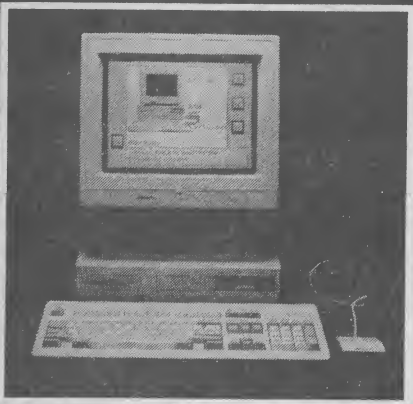

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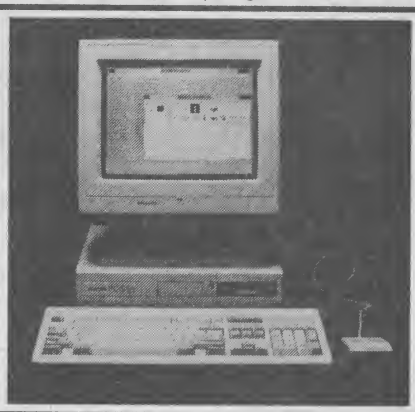

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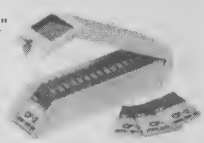

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MINI-D 640K D/D	£499	£799
MINI-H 640K HD20	£899	£1199
AT286-10 640K S/D	£799	£1099
AT286-10 640K HD30	£1099	£1359
AT286-16 1MB S/D VGA		£1399
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VICTOR V286P	30MB	£2499

AMSTRAD

MODEL	MON	COL	EGA
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PCW8512	£395		
PCW9512	£424		
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PC2386HD	£1702	£1787	£1872	£1957

All genuine models not upgraded in any way

HYUNDAI

Note, Base units only. Monitors are separate.

Model	Mono	Col	EGA	VGA
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Super 16-TE S/D	£361	£361	£455	£511
Super 16-TE D/D	£430	£430	£524	£580
Super 16-TE HD30	£561	£561	£655	£711
286C 8/10MHZ 512K RAM				
286 S/D	£749	£749	£749	£859
286 HD30	£949	£949	£949	£1059
386SX 8/16 Mhz 1MB RAM				
386 S/D	£959	£959	£959	£1069
386 HD30	£1159	£1159	£1159	£1269
386C 8/20 Mhz No Wait States 1MB RAM VGA				
386C S/D	£1279	£1279	£1279	£1279
386C HD40	£1599	£1599	£1599	£1599

SAMSUNG

Model	Mono	CGA	EGA

All the following Systems are without Monitors. Please refer to monitor box.

PC/XT			
SPC3000/1 S/D	£405	£405	
SPC3000/2 D/D	£473	£474	
SPC3000/3 HD20	£677	£677	
AT80286 10Mhz			
MFC6000/1 S/D	£812	£812	
MFC6000/2 S/D	£1015	£1015	
SPC6500/3 HD20	£1151	£1151	
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SPC6512/3 HD20	£1219	£1219	
SPC6512/4 HD40	£1354	£1354	
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286SL HD42	£1163	£1342	£1465
286V HD42	£1463	£1663	VGA'S
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286VE HD42	£1596	£1796	VGA'S
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VPCIIC D/D	£1099	£1299	£1549	£1599
VPCIIC HD30	£1499	£1699	£1949	£1999
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V286C D/D	£1499		£1799	£1999
V286C HD30	£1999		£2299	£2499
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V286A HD30	£2099		£2549	£2599
V286A HD50	£2299		£2749	£2799
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	7913 £81		9053 £296	9053 £296			
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AMSTRAD	12MD £119		14CD £199		12HRCD £294	14HRCD £383	
AKHTER	ACL12G £60	ACL14G £85	VISION £199	ACL-3 £259	ACL-VM £110	ACL-V £289	ACL-M £355
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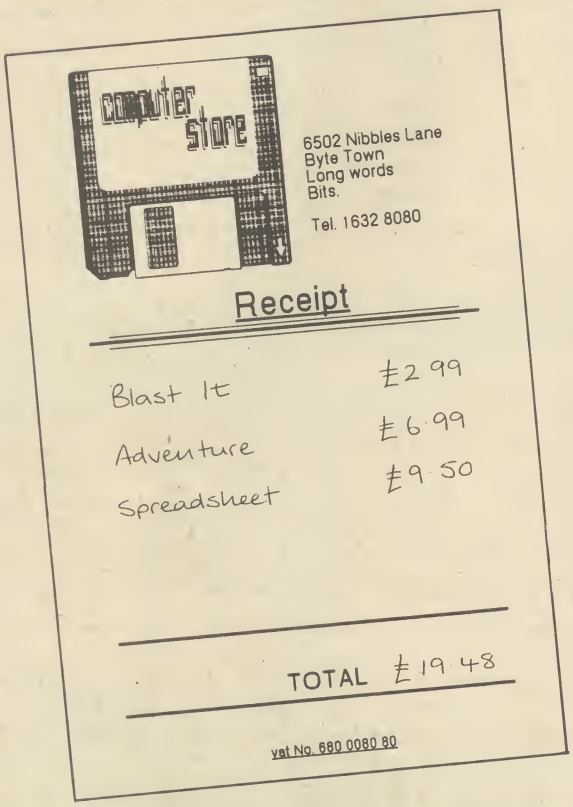

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64 (Tape) not disk – users club about to start up – going global soon. Trade, Demos, comps: For details S.A.E. to: D. Mason, Ethorpe Hotel, Gerrards Cross, Bucks, SL9 8HY.

ADVENTURE enthusiast seeks contacts to exchange ideas etc for ST and PC games. Mr S Lucas, 47 Longcroft Lane, Cheadle Hulme, Cheshire.

AMIGA Contacts wanted to start FREE beginners club in the south to swap games, cheats, tips etc. Please contact David after school on 0425 279835.

AMIGA Contacts wanted. Write to Simon, 30 Diamond St., Saltburn, Cleveland, TS12 1EB or Call (0287) 24167.

AMIGA contacts wanted 100% reply fast and reliable. All welcome write to: Steve, 4 Stopgate Lane, Aintree, Liverpool L9 6AP.

AMIGA contacts wanted all around the world to swap latest stuff. Write to: Tariq Al-Ali, PO Box 66957, 43760 Bayan, Kuwait. 100% reply. Hi Mad M.

AMIGA contacts wanted for fast reliable new stuff. Send disks and letter to: 36 Friar Road, Brighton, East Sussex BN1 6NH. 100% reply. World wide and local. No lamers. Bye!

AMIGA contacts wanted in the Hull area. Write to A.B.B., 39 Cambeak Close, Bransholme, Hull HU7 4ES. PS What is an ST?

AMIGA contacts wanted to swap good games. 100% reply. Write to 1 Dewlands, Oakley, Bedford MK43 7RW. Hi to Ken in Merseyside.

AMIGA contacts wanted to swap latest stuff, must be fast 100% reply, send list etc. R Hadden, 17 The Rise, Norhawram, Halifax, West York. or tel (0422) 206614.

AMIGA contacts wanted. User Group, demo's etc. Cheats disks. List sent. Send S.A.E. to Steve Hayward, 29 Effra Road, London SW2 1BY. 100%.

AMIGA contacts wanted: Write to Danny, 5 Beckside North, Beverley, North Humberside HU17 0PR. Send disk or letter, 100% reply posted next day. Also Amiga cheats disk for sale £2 each.

AMIGA newcomer, contacts wanted, usual stuff – swap games, tips etc. Where do I get cheap disks? Write to Kev: 20 Cypress Avenue, Ellesmere Port, Cheshire LG6 2UU.

AMIGA owners in Nottinghamshire! Please mail details to help create a local user network. S.A.E appreciated. Replies guaranteed. Be patient! Mansfield A500, 4 Poplar Street, Mansfield Woodhouse, Mansfield, Notts NG19 9LB.

AMIGA owners in South East (Essex) wanted to start free! Club, with regular meetings. Write now to Neil, 53 St Marks Road, Canvey Island, Essex SS8 9NJ.

AMIGA users contact Andy at 80 Central Drive, B'Pool, Lancs, FY1 5QD, England to get demos, utils, tips for the Amiga!!!

AMIGA users group. Every Thursday night in South East London. All welcome, beginners, male or female, also wanted. Programmer to help with club. Contact: Alan, 01 708 0146.

ANY computer users who use Klaver Music Notation interested in forming/joining a user group; ring Mike on 01 520 5223.

BBC contacts wanted to exchange software, hints, tips etc. All letters replied to, write to K. Scotney, 17 Cromer Avenue, Burley, Lancs BB10 3HA.

BOURNEMOUTH and POOLE Atari User Group. Support for 8 Bit and ST. Monthly meetings. Membership £8.00. Quarterly Newsletter 8i16, £3.80 four issues. Details write to: 248 Wimborne Road, Oakdale, Poole, Dorset.

CALLING all hackers anyone interested in setting up a society write to me, Whizz Kidd's and hardware freaks welcome, all letters answered and treated in strictest confidence.

COMPUTER Student Contacts Wanted. Write to A. M. Drewett, 37 Longdon Ave, Aylesbury, Bucks HP21 9UW.

DISK magazine for Amiga freaks. Send Submission on disk to: Arthur Wyatt, 68 Shefford Road, Meppershall, Shefford, Beds. Submission disks get returned with magazine on, blanks returned as blanks.

DOES anyone know of an ST user club in the Wirral/Merseyside area that is open to membership? Please ring 051 678 8519.

DOES anyone know of an ST user group in the Reading / Wokingham area? If so please phone: Matthew by Tel: 0734 788085.

FAST Amiga contacts wanted, repeat fast! Send Discs or Letters to: Andy, 35 St Annes Drive, Aylestone, Leicester LE2 8HU.

GWYNEDD, N. WALES. ST User Group. I want to get in touch with all local ST Users to form a new group. Contact S. Rammerling, Clogwyn Plas Gwyn, Pwllheli, Gwynedd, N. Wales, LLS 36UA.

HYPERPAD – interested in forming a user group? SAE to Dave Langstaff, 78 Harrison Road, Swaythling, Southampton, SD2 37J.

IF You want to spread your groups in Asia. Send your latest + your demos to: Tariq, P.O. Box 3581 Safat, 13036, Kuwait. 100% reply, Amiga Only. Also will swap spot.

INTERESTED in joining a Kick Off League in London? With trophies for winners? Contact Ray at 30 Windsor Crescent, Wembley Park, Middlesex, HA9 9AW or ring 01 904 0555 between 6pm-11pm.

IS there a Clipper/DBase 3+ User Group in London? I will be grateful for any details. Guy Ellis, 23 Sussex St., Pimlico, London, SW1V 4RR.

ISLE OF WIGHT PC User Group. Anybody wishing to join should contact I.O.W. 0983 614277/614649 and ask for Sean.

JOIN CMUG the best Christian Micro Users Group. S.A.E. please to CMUG, 15 Howard Street, Gloucester GL1 4US.

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KENT youth computer group at the Bowen Youth Centre, Kingsnorth Road, Ashford, Kent. All makes of computer. Write to Kris for details.

LAMER? Want to swap software, tips, demos and form a Lamers against Lamers Society? Then contact, Faisal Patel, 73 Track Road, Batley, W. Yorks, WF17 7AB.

LIST the low income ST User Group for students and the unemployed send two blank disks to Marcus, 9 Days Green, Chapel Street Mary, Ipswich, Suffolk IP9 2HZ for details.

NINTENDO contacts wanted for swaps and setting up of User Group! Write to: Ashley Middleton, Amberley, Park Drive, Little Aston Park, Sutton Coldfield, B74 27A, 100% reply.

PC200 user I think it's OK! Did you buy the other one? What do you think of it? Give me a ring 0432 266451 Neil.

PCW Users Interested in P.D. send S.A.E. to: PCW-File, 18 Sunbrow,Haslemere, Surrey GU27 2QP. The PCW-File is on Boog BBS 0252 626233, 24hrs, V21/V23. No Fees.

READ this now! Amiga contacts wanted to start a group or just swap stuff. Contact Phil at 52 Altofts Lodge, Drive Normanton, West Yorks WF6 2LD. No lamers!!!

SCOTTISH QL Users Group. Your chance to meet other QL and Thor users north of the border. Contact Alan Pemberton, 65 Lingerwood Road, Newtongrange, Midlothian, Scotland.

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SOLIHULL, West Midlands Atari ST User Group meet second Tuesday of every month, other machines also accepted especially ARC's and even Amiga's. Phone 0564 770132 after 6.30 ask for Richard.

SPECTRUM Owners Join Indug, the World's largest Spectrum Users Group. Monthly Magazine, Discounts, Support + much more. Send A5 S.A.E. for full details to INDUG, 34 Bourton Road, Gloucester.

SPECTRUM User Group monthly magazine hints, tips, pokes & demos. For full details send S.A.E. to Rob Tronics, 61 Doyle Road, Bolton BL3 4SA.

ST contacts wanted if into Agtomation or any other, then write or phone 110% reply, almost. Lee Edwards, 24 Topllan Road, Glan Conwy Clwyd, LL28 5NP tel: 0492 580447.

ST user: Help!, I'm Australian and have just bought an ST (used to own a C64 in Oz) Anyway, I am looking for good contacts and also anyone in Bradford interested in starting a users group. Contact David Marshall, 5 Highfield Road, Five Lane Ends, Bradford, W.Yorks.

ST users in Bradford, I'm starting a users group, just contact Dave on: 614945 and get the most out of your ST. NO FEES!!

TAKE advantage of the free helpline service, get in touch with other C-64 users, etc.... Join 'Crystal Unicorn'. No fee's!!! Adam, 'Redways', Harps Hall Road, West Walton, Wisbech, Cambs. PE14 7DJ.

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ANYONE with PC hardware/software compatibility problems or having trouble deciding which PC compatible to buy. Call Paul on 061-962 7934, evenings. Completely free service!

BEEB help offered, including BCPL Basic and machine code. Write to Owen Astley, Dunelm, Durham Moor, Durham City, DH1 5EU. No SAE, no reply

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DO you need programs written on the Amstrad CPC range? Write to me now! Keith Grimsditch, 12 Reddish Vale Road, Reddish, Stockport, SY5 7HE. The sooner the better!

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I can help with spares for Amstrad Commodore Sinclair computers, also TV and Video recorders. Can anyone help new Amiga operator? Ring Paul on 0332 760353.

MIMI 802 help! Erased system disc please phone 0737 823498 ask for Stupid John.

SOMEONE who can video digitise photos, mags etc..... will gladly sound sample anything they want done – write now! To: Neil Mansell, 53 St Marks Road, Canvey Island, Essex, S58 9NJ – don't delay!

STUDENT offers help with all aspects of MS-DOS, including Batch Files and Pipes/Filters. Send Query to: N Stubbs, 6 Lindrum Ave, Lyme Green, Macclesfield, SK11 0LG

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TO PCW beginners. Locoscript, Newsdesk International. SAE to: John Peters, 299 Southway Drive, Southway, Plymouth, Devon, PLL 6QN. Share a problem, find an answer!

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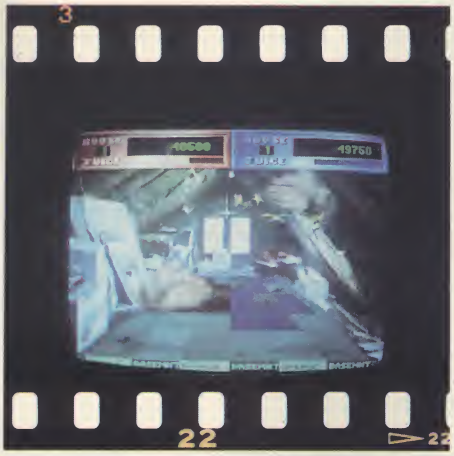
New in the arcades today, new on your computer next year. Jeffrey Davy played some of the latest coin-op releases at this month's Olypia arcade game show.



• Exterminator: *control the hands to crush the spiders.*

• *Blast the zombies to pieces in* Beast Busters.

• *Spot the reprobate in* Special Criminal Investigation.

LICENCES OF TOMORROW

The sight of 50-year-old be-suited figures gripping recoil-action Uzi machine pistols and blowing zombies into bouncing fleshy bits is, you have to admit, a rather odd one. Things get stranger. It was possible to spend a whole day playing both arcade classics and unreleased future hits completely free. Money, who needs it? No-one did at the 46th Annual Amusement Trades Exhibition in London's Olympia Grand Exhibition Hall. Here was the show to end all shows, an arcade-freak's dream, row upon row of cabinets ready to run.

Clambering through the debris of the has-beens and won't-bes, the following games came to light. Today they are in the arcades, tomorrow watch out for them on your computer.

CRIMINAL CHASING

Effectively *Chase HQ II*, *Special Criminal Investigations* puts you back in the driving seat for another bout of criminal chasing. There is no 'investigation' involved, just another turbo-charged burn through the streets of America.

Gone is the dull black Porsche of old, to be replaced by a shiny red sports car with a blue flashing light and a sun-roof, out of which pokes Mr/Ms Detective with a gun.This time you blow the criminal off the road, none of that namby-pamby dodgem-car bumping here!

By far the funniest touch is the attempted Cockney accent of the criminals. An amusing try, but Japan is hardly within the sound of the Bow Bells is it?

LIKELY STORY

Isn't it always the case – you're caught in an enemy base and forced to blow your way out pursued by everything the foe can muster. Happens every day.

This scenario is an excuse for *Line of Fire*, an *Operation Thunderbolt*-esque blasting game which twists and turns at corners and roadblocks, the view swivelling by 90 degrees at a time. Armed with just a machine gun you and a colleague can decimate everything in sight from a jeep, plane, helicopter, boat...

ZOMBIE KILLERS

Beast Busters consists of more gratuitous machine-gun-wielding *Operation Thunderbolt*-based action as zombies attack from all sides, doing the bidding of hideous aliens. Up to three people can play at a time – the zombies don't stand a chance, but they're making a go of it.

As you cut them down blobs of zombie flesh fly everywhere, while on later levels creatures explode out of people's backs, and cars metamorphose into aliens.

STRANGE TIMES

There are some strange people in this world, but none can be quite as odd as those who dreamed up the concept of *Exterminator*. The idea is to clear a house of beast infestation using a massive disembodied hand to pound, grab and – bizarrely – shoot, waves of advancing nasties.

Plagued by wasps (which must be shaken away), mosquitoes, and frogs, the game is almost surreal. It's charm is in its digitised graphics and sound and its all-out oddness. Whatever it is the designers were taking, I think I want some.

DOG'S DINNER

"In *Shadow Dancer* a Ninja dog battles side by side with his master..." says Sega, which has returned with a sequel to *Shinobi*, a sort of *One Man and His Dog* for the tough streets of the Nineties.

It's two-level action, like *Shinobi* but with, errh, a dog as well. It also has an astounding smart-bomb sequence for which the game cuts to a screen with an incanting Ninja, impressive music, and a flame background before returning to obliterate every enemy on screen at the time.

HONOURABLE MENTIONS

Honourable mentions go to those that just weren't that interesting but which will doubtless end up on home computer anyway...

• *Round Up* squealed in as a neat *Chase HQ* clone without the polished graphics of its influence.

• *Winning Lap* qualified as a realistic, hydraulic-cabinet-based racing game with crisp graphics.

• *Big Run* rallied strongly as a cross-terrain racing game with pleasant scenery.

• *Four Trax* is a charming little dirt-track circuit game. ■

• *Prepare for obliteration in* Shadow Dancer.

• *Your faithful Ninja poodle will help you with what's left.*

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MULTIMEDIA MANIA

Multimedia – the combination of text, sound and graphics via a computer – is catching on. Jason Holborn looks at Ultracard, the Amiga's very first multimedia toolkit.

● ULTRACARD

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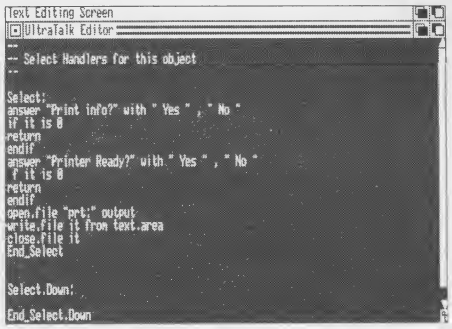
The Amiga has long been seen as an ideal machine for creative computing. Any computer can crunch a load of meaningless numbers, but you'd be hard pushed to find a machine that is as versatile when it comes to video, graphic and audio applications.

The latest growth area within the industry is that of the multimedia workstation, where one machine can control information of all forms (be it graphic, audio or textual) from within a common user interface. With the Amiga's obvious potential in this area, the machine has been surprisingly slow to assert itself, while the wide market base of the arguably less qualified machines like the Macintosh have been riding the multimedia wave. However, all that could change with the arrival of the Amiga's first true multimedia toolkit.

• UltraCard *provides a powerful working environment.*



• *The UltraTalk programming language is simple to use.*

RIDING THE WAVE

Ultracard is a multi-tasking multimedia information construction set (that's what the manual calls it, anyway!) that allows you to bring together and control information in any form within a nice friendly user interface, which is collectively known as an *Ultracard* 'stack'. In practice, what we basically have with *Ultracard* is an Amiga version of the classic Mac *Hypercard* system.

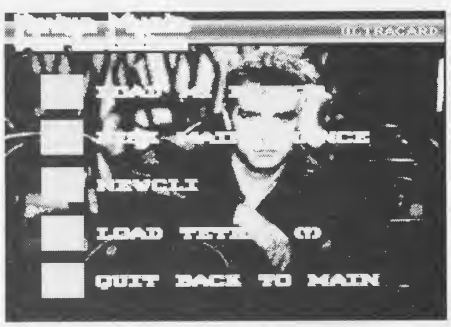
Information can be in the form of text, numbers, IFF graphics and sampled sound. A true multimedia system must also be able to pull in and store information from just about any storage device. *Ultracard* fulfills this requirement with the inclusion of full *A-Rexx* support. *A-Rexx* is a program designed to provide communication between any programs that support the *A-Rexx* standard. Any *A-Rexx*-compatible program can control, or be controlled by another program by sending and receiving commands through a standard *A-Rexx* port.

Although *A-Rexx* was not developed by Commodore, it seems certain that release 1.4 of the Amiga's operating system will include *A-Rexx* in ROM – thereby providing the Amiga with true task communication. Already many third-party developers are modifying their wares to take advantage of *A-Rexx* (*Digipaint* 3 and *Cygnus Ed* are good examples). Using *A-Rexx*, *Ultracard* can control input/output devices such as CD-ROM drives, videodisc players, and so on. The drivers for these devices must support the *A-Rexx* standard to work with *Ultracard*.

STACKING UP

Information is accessed within an *Ultracard* stack by setting up a series of one or more frames (pages if you like) that contain information that can be linked with other data within the stack. If the information to be handled is textual, 'hypertext' links can easily be introduced to make individual words, phrases or sentences act as 'buttons' to access further information of relevance. For instance, click on the word 'Amiga' and a new frame appears with information on the Amiga.

The real work horse of *Ultracard,* and indeed its cousin *Hypercard*, is the button (or 'object' as it is sometimes called). Buttons are rectangular 'hot spots' within a frame that can be set up to carry out particular tasks. When a button is first created, it is automatically assigned a script file that consists of an empty command template. What is contained within this script file determines what will happen when the user clicks on the button. Assigning a task to a button is therefore simply a case of inserting the relevant *Ultracard* commands into the button's script file – the rest is handled by the system.



• Use UltraCard *to customise the Amiga's user interface.*

The *Ultracard* command language is a BASIC-like scripting language called UltraTalk (once again, *Hypercard* users will spot the similarity with their own HyperTalk). Although UltraTalk is not a programming language in its own right, it contains many powerful structured programming constructs to control program flow and decision making. However, UltraTalk is geared specifically towards the creation of multimedia applications, therefore you will find commands to pull in information of all types, run external applications and even issue (and receive) *A-Rexx* commands.

Although this little lot sounds complex, constructing *Ultracard* stacks is simplicity itself. Using *Ultracard*'s comprehensive selection of editing options, even the most complex of stacks can be built up in a matter of minutes. If you're the creative type, you can even load IFF picture files (created within paint packages such as *Deluxe Paint III*) for use as backdrops to the frames within your stacks.

ULTRACARD AT WORK

All this talk of multimedia toolkits is all very nice, but who would most benefit from the power of systems such as *Ultracard*?

Ultracard could justifiably be seen both as a tool for building information systems and as a simple way to tie together systems consisting of two or more previously incompatible programs.

Information systems could easily be designed as teaching tools, point-of-sale systems and information systems for use within museums, art galleries and so forth. In fact, just about any application that requires the control of textual and visual information using complex relational links could benefit from multimedia.

When a control system is required that consists of several distinct elements (off the shelf applications programs usually), *Ultracard* could be used to construct a shell to lock the user away from the complexities of the machine's operating system. This way, similar systems could be implemented across different machines without the user having to learn the individual quirks of each different type of machine.

HIGHLIGHTS	DRAWBACKS
■ Very easy to use	■ Appalling manual
■ Includes comprehensive A-Rexx support	■ Needs several megabytes of RAM to fully exploit the program's potential
■ Complete multimedia toolkit	■ Rather unstable at times
■ Comprehensive help facility	
■ Complex systems can be constructed in minutes	

CONCLUSIONS

Although *Ultracard* is not perfect – the program still contains several glaringly obvious (and often fatal) bugs, and the manual is terrible – it points the way forward for multimedia applications on the Amiga.

With the release of *Ultracard,* the Amiga has finally come of age as a true contender within the multimedia market. ■

THE CHIP FACTOR

Part two of our comprehensive guide to the PC compatible looks at processors and memory chips. Mike Hardaker is your silicon guide

The essential part of any computer – from the smallest micro to the biggest supercomputer – is the central processing unit or CPU. Microcomputers use a CPU which is built on to one silicon chip: this is called a microprocessor.

Microprocessors tend not to be made by the computer manufacturers themselves, but rather by companies which specialise in the manufacture of chips, and who sell their microprocessors to a variety of other concerns. This means that many microprocessors are built into a number of different computers and so gain a reputation which is separate to (if tied in with) the microcomputers they power.

The first generation of microcomputers used microprocessors such as Zilog's Z80 (used in the Spectrum and the Amstrad CPC) and Motorola's 6502 (the BBC micro and the Apple II). More modern, sophisticated machines tend to use either the Motorola 68000 family of processors (found in the Atari ST, the Commodore Amiga and the Apple Macintosh) or the Intel 8086 family used in the PC and its derivatives.

INTO INTEL

Intel's current range of CPU chips started with the 8080, which was at the centre of many American micros in the late Seventies. Its successor was the 8086, which is the basic PC chip. The 8086 is what is known as a 16-bit microprocessor, which means it can process 16 ones or zeros (the binary raw material of any computer system) at one time. In practical terms, this represents two characters – letters or numbers.

In fact the 8086 was not actually used in a genuine IBM PC until 1987, some six years after the launch of the original. The original PC used the Intel 8088 chip. This has identical 16-bit internals to an 8086, but communicates with the rest of the computer a mere 8 bits at a time. IBM chose the 8088 to allow the use of cheaper, 8-bit peripheral chips which were readily available from a previous generation of computer. As far as most PCs are concerned, however, the 8086 and the 8088 are essentially identical.

1984, and the IBM PC-AT, saw the first appearance of the 80286 chip. If you are running the MS-DOS operating system, this behaves exactly like an 8086, only faster. It does have other functions, but very few MS-DOS programs are able to use them – examples are the latest version of the Lotus *1-2-3* spreadsheet, and Microsoft Windows.

The closing months of 1986 saw the first PC with the 80386 chip, from Compaq. This can also operate as a very fast version of the 8086 and it can perform the same special functions as the 80286. However, it does offer a third form of operation. The 80386 can be run in 'virtual mode', which means it can pretend to be several 8086 processors running simultaneously. This allows several MS-DOS programs to run at the same time – so you can recalculate a massive spreadsheet while you are typing a letter in a word processor. This is known as multi-tasking.

The 80386 is a 32-bit chip, so it can process four characters at one time. Its kid brother is the 80386SX, which is to the 80386 what the 8088 was to the 8086. It handles information internally 32 bits at a time but talks to the outside world in 16-bit chunks. This allows it to use the cheaper peripherals normally associated with the 80286.

The latest member of the 8086 family is the 80486. This is best thought of as a fast 80386. It is functionally identical, but has been redesigned so it operates at between two and three times the speed.

MEMORY BANKS

The CPU only processes information – you also have to have somewhere to store it. Long term storage is on disks (see next week's *Express*), but disks are slow when it comes to finding data and then shifting it into the processor. Therefore, while data is actually being shuffled to and from the processor it has to use something rather faster. This is known as memory, or Random Access Memory (RAM). As its name suggests, you can go to any area of RAM at any time and get at the data held in it. This data is brought into RAM from disk as it is needed, and sent back when it is no longer required.

It is obvious that the more RAM you have, the quicker your machine will be, since it will do less swapping of data between disk and memory. The 8086, however, can only use ('address' in the jargon) one megabyte (1,048,576 characters) of RAM – it only recognises the existence of a million locations for a character of information to reside in memory. Therefore, any extra memory will usually be wasted. To complicate matters further, when IBM designed the PC, they reserved 360K (K is kilobyte, or 1,024 characters) of the RAM for proprietary code. Therefore, the true PC compatible can only use 640K of RAM.

This seemed a huge amount in 1981. The first PCs were shipped with 16K of RAM, although an upgrade to 64K was recommended for business use. However, the computer industry develops faster than most others, and it is now seen as a serious restriction. Many PC applications now demand the full 640K and it is foolish to buy a machine which has less.

MORE MEMORY

To break through the 640K ceiling, three separate methods have been used – expanded memory, extended memory and a different operating system to MS-DOS.

Expanded memory uses a 64K area of memory which the PC can see and swaps data from the otherwise invisible extra memory in and out of it. Each 64K block is called a page, so this system is called 'paged memory management'. There is only one standard worth talking about when it comes to expanded memory and that is LIM EMS (the Lotus–Intel–Microsoft Expanded Memory Specification). In its current form, this allows access to some 32Mb of memory above the 640K barrier. It does, however, have certain limitations. Under normal circumstances, only data (not programs) can use this extra RAM – so if you have a spreadsheet which is bigger than 640K you may well be OK: if your spreadsheet program wants to grow, it's got nowhere to go.

EXTENDING WELCOME

Extended memory, as opposed to expanded memory, is only available on the 80286 and 80386 processors. Whereas expanded memory is a way of muddling

A QUESTION OF SPEED

Processor speeds are measured in megahertz (millions of cycles per second). This is also known as a 'clock speed', and indicates the number of internal instructions the processor can carry out per second. As different instructions take different numbers of clock ticks to carry out, it is a very rough-and-ready measure of machine performance.

The first IBM PC came with a clock speed of 4.77MHz. This was standard on 8088-based IBM PCs and XTs until their demise in late 1987. In order to offer more than Big Blue, most clone manufacturers offered 8086s and 8088s which were tweaked to run faster. Between 8MHz and 10MHz is now standard for an XT-class machine.

When the 80286-based AT came out, it was rated at 6MHz. This does not mean it was slower than an 8MHz XT, however, for the 80286 has a more efficient design than the 8086 so can frequently perform an instruction (add two and two together, for example) in less cycles than its predecessor. Today's ATs run at between 12MHz and 20MHz. 16MHz represents a good average – a pretty quick machine.

Similarly, the 80386 (which arrived at 16MHz) is more efficient than the 80286. Most 80386 chips are now sold at 20MHz or 25MHz. The real chargers run at 33MHz – these are seriously fast. 80386SXs are usually rated at 16MHz.

Although the 80486 runs at the same 25MHz and 33MHz speeds as the best 80386s, its internal design is so much more efficient that it performs instructions at over twice the speed of a similarly-rated 80386.

In general, the quicker the processor the better. Having said that, the processor is not the only factor which controls the overall performance of a PC. In certain applications – word processing, for example – the disk is far more of a constraint than the processor. To compare the PC with a car, a V12 Jaguar engine stuck into a Morris Minor will make it go a lot faster in a straight line, but it won't go around corners any quicker – the suspension is the limiting factor, not the power.

Memory is rated according to its access time, which is measured in nanoseconds. In general, you can ignore this – any PC which has been properly put together will have memory of a speed appropriate to its processor. The two elements must work together, and most PC manufacturers are bright enough to know that. The thing to look out for in machine specifications is the 'wait state'.

Some PC companies use slow, cheap memory to cut down the price of their machines. Because the memory is not able to cope with the speed of the processor, wait states are introduced. This means that the processor asks the memory for data and the memory says, 'wait'. The processor goes through another cycle or two and then asks again. The number of cycles the processor must use in order to get at the data is the number of wait states. One wait state is normal, zero wait states is great if you can get it, two wait states is pretty poor and more than two is unforgivable.

through within the 8086's 1Mb limit, extended memory is simply ordinary RAM which extends above 1Mb. This sounds much more logical until you remember that MS-DOS assumes it is using an 8086 (and thus only 1Mb). Very few MS-DOS programs indeed can use extended memory directly, and it is mostly valuable in the MS-DOS world if it can emulate LIM EMS expanded memory.

DIFFERENT DOS

The obvious solution to these memory problems is to say that MS-DOS is at fault and to replace it with a different operating system. Two main contenders exist – Unix and the Microsoft/IBM OS/2 (Operating System/2). Since both of these use extended memory they require an 80286 or better. Unix is a standard operating system in many scientific environments and has a growing business software base. However, despite recent moves to improve it, it is as user-friendly as a cornered rat. Also, to be frank, there are better machines than the IBM PC for running Unix.

OS/2 has the weight of the biggest hardware supplier behind it, together with support from many PC software houses. As yet, however, the programs do not really exist. This will undoubtedly change over the next couple of years and it is probably fair to say that OS/2 represents the future of the PC. For now, however, it is expensive (mostly because a viable OS/2 system requires at least 4Mb of RAM and preferably 6Mb) and doesn't have sufficient software to make it viable. And when you get down to it, that's what counts. Nobody buys a PC because it has a sexy processor – they buy it because of the vast range of powerful application software. And that means MS-DOS.

CONCLUSION

For most simple business functions, the 8086 and 8088 CPUs are fine – they are inexpensive and they run nearly every piece of PC software. It is probably best to think of the 80286 as a fast 8086 – it can run OS/2 and Unix, but the word on the streets is that new versions of OS/2 will provide significant extra function for 80386 users only. On the other hand, the 80286 is noticeably quicker than the 8086 and doesn't cost that much more these days.

The 80386 is the chip with a future: if you can afford one, buy one. The 80386SX provides access to all the same software but will probably appear slow in a couple of years' time, overloaded with as-yet-unannounced programs. On the other hand, it costs a lot less than the full-blown model. The 80486 is still firmly in the one-day-when-I'm-rich category. If you've got a whole load of money burning a hole in your pocket, a 486-based PC is probably a sound investment – but do bear in mind that prices will come down sharply, they always do.

If you know you want to perform MS-DOS applications for the foreseeable future, buy the fastest chip you can afford – the 286 probably offers the best value for money in this area at the moment. If you think your requirements might change in a couple of years, get a member of the 80386 clan and invest in the future.

If you're going for an 8086 or 8088, stick with 640K of memory – save your money. With an 80286, 640K is fine, but 1Mb or 2Mb is better, as long as you can configure it as LIM EMS. With 80386-based machines, the more the merrier – each 640K represents another 'virtual' 8086, remember. You might not need the extra RAM straight away, but make sure you can fit it later – you'll surely want to. Applications such as desktop publishing can use up more memory than you expect.

The ultimate practical PC in 1990 is probably an 80486 with about 8Mb of RAM – more would be nice but there's no sense in being greedy. ■

THE PROCESSORS

1 8086

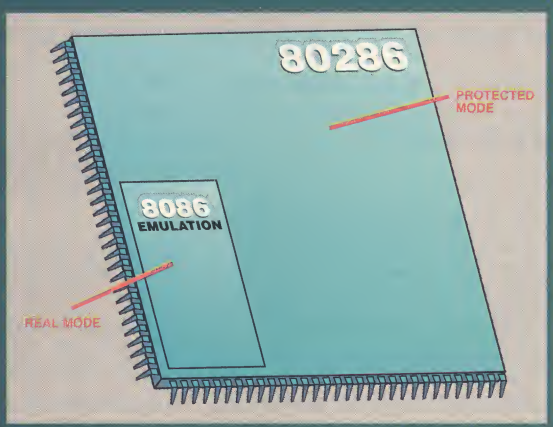
This is the basic chip inside the PC. The MS-DOS operating system assumes it is talking to an 8086. If your PC does not have an 8086, its processor must be able to emulate one.

8088

This is a cut-down version of the 8086, which uses an 8-bit data bus (the method of parcelling data in and out of the CPU) against the 8086's 16-bit bus. Since most PCs use the same physical architecture as the basic IBM PC (which had an 8088) there is little advantage in having an 8086 rather than an 8088. For practical purposes the two should be seen as identical, although the 8086 may be marginally faster in some circumstances. Machines which use the 8086 and 8088 are normally called XTs, after the IBM PC-XT, the XT standing for eXtended Technology.

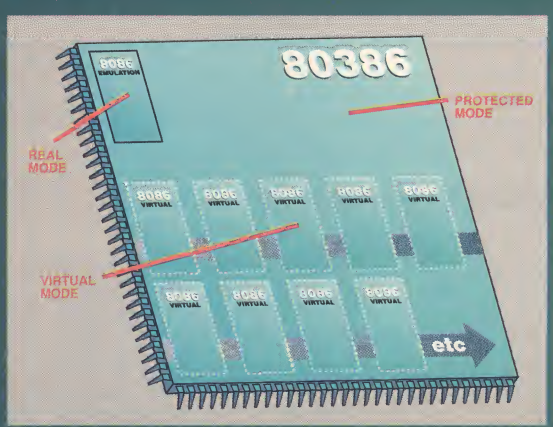
NEC V20 & V30

These are clones of the 8088 and 8086 respectively. With slightly different internals, they sometimes outperform the originals. Compatibility problems are few and so they represent good value.



2 80286

This represents the next generation of PC processors. It can run in the same way as an 8086 (which is called 'real mode') but it also has a 'protected mode'. This allows it to address 16Mb of memory (16,777,216 characters) rather than the 8086's 1Mb. The industry-standard MS-DOS operating system cannot use this, however, and you must use another operating environment like OS/2 or Unix to exploit it. Machines which use the 80286 are called ATs.



3 80386

This is the current state of the art. It provides the ability to emulate an 8086 ('real mode'), together with the 'protected mode' of the 80286 – in a more robust and better-developed form. The 80386 also has a 'virtual mode' which allows it to emulate several virtual (imaginary) 8086s at once. A 32-bit chip, it is the current favourite for software developers. PCs with 80386 microprocessors are usually known as 386 ATs or just 386s.

80386SX

This runs the same software as the 80386 (in 'real', 'protected' and 'virtual' modes) but talks to the rest of the computer like a 16-bit 80286. It provides a budget way in to the 386 world.

80486

In practical terms this is a very fast 80386. It runs the same software and sits in the same PCs – it just does everything faster. Because of Intel changing the way it chooses to refer to its products it is commonly known as the i486. Computers which use this chip are known simply as 486s.

8087,80387,80387

These are maths co-processors. Their specialised function is to take mathematically intense calculations away from the main processor and do them more efficiently. Not all programs support maths co-processors, but most software involved in heavy calculation (such as big spreadsheets and computer-aided design) does. The 8087 works with the 8086 and 8088, the 80287 with the 80286, and the 80387 with the 80386. The 80486 has a maths co-processor built in to it, so it doesn't need another.

TECH TIPS

Does your PC keep packing up? Is your Amiga less than friendly? Would your ST try the patience of a saint? Write to Uncle Tech Tip, he'll see you right. Send your sorry stories to Uncle TT, 30 Monmouth Street, Bath BA1 2AP. There's a prize for the most pitiful tale

HELP! No KindWords!

I've just bought myself a printer and word processor for use with my Commodore Amiga. Unfortunately, I made the mistake of buying *KIndWords 2.* As I am sure many others must have found before me, it is abysmal. From the frequent gurus that occur if you cancel a requester, to the amazingly bad three-second wait required for a keypress to register when you re-edit your document, the whole thing appears to be bug-ridden and generally horrible to work with.

As I can't put up with it any more I'd like to buy another word processor. Having been stung for £50 the last time, I don't want to make the same mistake again. Can you recommend a good word processor? I am used to the speed of the Amstrad PCW's *LocoScript* and want something as good as that or better. I also may dabble in desktop publishing at some point. Is *PenPal* – a cross between a word processor and a DTP package – any good? Is it worth the £120 asking price?
Richard Harris, Cheadle, Cheshire.

Protext from Arnor (0733 239011) is the word processor you want. Thousands of Amiga, ST and PCW owners swear by it. It's powerful and fully featured. *Protext* costs around £80 (or less if you examine the discounter's ads in Shopping Express).

PenPal is a good program, but my advice would be for you to forget the DTP packages for now and plump for a dedicated word processor. In that way, you'll get everything you want from a word processor and can buy a desktop publisher a little later.

TIP Baud and logging

In reply to the embarrassed computer studies teacher (*Express* 56) regarding *Procomm* software. The only version of *Procomm* that supports the 1200/75 split baud rate is the fully registered version of *Procomm Plus UK.* Registration is about £150 for the full package, which includes a viewdata mode for use with Prestel and other split baud rate services.

There are, however, other shareware comms packages that do support the 1200/75 standard. *Eazilink* and *Greycomm* are two examples that should be available from libraries for between £3 and £8. Alternatively, if the teacher would care to send me a couple of disks and a stamp I will send them copies of the above software for free. This will of course, mean revealing their identity and address to me, but that is probably a small price to pay for solving the problem, gaining promotion and ultimately saving the Universe.

In fact, I'll do the same for anyone else on one condition: no disks/stamps, no software!
Mike Underwood, 7 Fernie Way, Wellingborough, Northants NN8 3LB.

TIP Take out the trash

I have found a brilliant little trick for owners of the Atari ST who are fed up with having the word 'Trash' on their trash icon on the Desktop *(I find it's a constant source of worry and sleepless nights – Uncle Tech Tip).*

Simply load your `DESKTOP.INF` file (you only get one of these if you change the parameters in GEM, for instance changing resolution from low to medium on your boot disk, and save the Desktop) into a word processor capable of manipulating and saving ASCII files. I used *1st Word* which worked perfectly.

If you look down the text you will you will see the words 'FLOPPY DISK' twice and then 'TRASH'. All you have to do is change the word 'TRASH' to a more English term like 'rubbish' or 'bin', taking plenty of care not to delete or change anything else. Then erase the `DESKTOP.INF` file on your boot disk, re-save the file in your word processor as `DESKTOP.INF` and hey presto! You have a more English-looking Desktop.
Michael Kirk, Stevenage, Hertfordshire.

TIP Slow mouse

I would like to suggest a further tip for Michael Batchelor's slow mouse response problem highlighted in your Tech Tips column in issue 61. It may be that he considers the response to be slow and that he is not suffering from a physical problem at all. It would be cheaper to first clean the mouse as you suggest and then try one of the many public domain utility programs available to speed up mouse movement.

Two of which I am aware of are *Fast Mouse,* which is an accessory from the Desktop, and *QMouse* which is in .PRG format. The latter I can vouch for as giving excellent results. Both programs inciden-

HELP! Don't blame the joystick for all your woes

Just before Christmas I pointed out to my wife a good joystick shaped like an aircraft yoke which I quite fancied *(Whatever turns you on – Unc).* Lo and behold, Santa duly delivered it to my stocking!

Unfortunately, I could not get to grips with it, as I did not find it as precise as my old Quickshot for *F16* work. But that's not the problem. When I booted *F16,* I found that the keyboard locked even though the auto-fire was not enabled. The manager at the local shop where my wife bought it said that this was normal with the new breed of joystick and that if I booted up with *F16* with the joystick disconnected, it would then be OK. It was, but as I didn't like the stick anyway, he took it back and I bought a Challenger infra-red joystick. It performs well, but now even if I boot up a game without connecting it, the keyboard is totally useless. Is this the way joysticks work, or is there some way around this problem?
Graham Ball, Weymouth, Dorset.

• The Challenger remote control joystick: not the source of the problem in Uncle Tech Tip's opinion.

There's no reason why connecting a joystick to your computer should inhibit the operation of the keyboard (although auto-fire joysticks do slow down the time taken to register a keypress). And forget the nonsense that your local computer store lackey was spouting, a new breed of joysticks indeed!

Sounds to me like there may be a physical problem with your keyboard which has coincided with the purchase of a joystick, thereby leading you to believe that that was the cause. Try the keyboard with several programs such as a word processor, a utility requiring keyboard input and so on. If your still experiencing the locking problem then it's probably time to have the machine looked at by a good computer engineer.

If there's no problem with software other than *F16,* I don't know what could be causing the keyboard fault. Perhaps, that program has some small bug? As you didn't tell me very much about your computer in general, or the sequence of events before, during and after a software boot-up, it's difficult to offer a suggestion as to the problem.

tally, have been released on the cover disk of your sister publication *ST Format* at different times.

Trying the above is much better than shelling out £40 straight away, especially as it may be totally unnecessary.
Ken Jagger, Morley, Leeds.

HELP! Backup bumpf

I have only recently upgraded from a Spectrum Plus 3 to an Atari 520ST. I am going to buy a second disk drive and some sort of back-up device – I want to get Multiface or Synchro Express from Datel, purely to back up my own software. I have already had *Xenon II* destroyed by a virus given to me by a friend on a public domain disk! I am not bothered that it will be cheaper to get Synchro Express, I would just like to know whether either will back-up things like multi-load levels.
Michael Kirk. Stevenage, Herts.

Are you aware that it is illegal to make back-ups of copyright software even for personal use?

Third-party replacement disk suppliers abound at the moment. One of the better offerings (and the one that I use) is that available from Evesham Micros. It's very compact and neat, comes complete with a dinky little power supply and is a well-made unit that should give many years of life. Currently, the drive costs £79.95, but have a look at Evesham's advert in Shopping Express as the prices fall all the time. Contact Evesham on 0386 765500.

Despite the controversy currently raging through the industry, hardware-based back-up devices continue to be marketed and sell in huge numbers. No drive available will back-up 100 per cent of software – as each device appears, programmers devise new methods of protection in order to defend their copyrighted software – but some are indeed better than others.

My recommendation would go to Romantic Robot for their Multiface. Although not able to back up all software, the device has a high success record and is simple to use. It also provides little goodies, like grabbing screens from your favourite software and saving them in Degas format, and examining the code that makes up the software. The Multiface costs £34.95 and is available from Romantic Robot on 01-200 8870.

HELP! Printer purchase

I own an Amiga 500 expanded to 1Mb with an external disk drive, which I use in conjunction with the reasonable 9-pin Canon PW-1080A printer. This has, until now, been perfectly adequate for my requirements, which are for fast, reasonable-quality graphics output.

I now wish to purchase *Protext* and therefore want to upgrade to a better printer, preferably a cheap, good-quality 24-pin colour device. It would have to be well supported and have good text output, as that is what I would mainly use it for – but colour is not that important.

I have considered the 24-pin colour Epson LQ860, which is a little too expensive; the 24-pin Epson LQ500; the inkjet Diconix 300 – although I'd prefer a dot-matrix – and the 9-pin colour Star LC-10, although 9-pins are a little slow. The Citizen Swift 24 comes highly recommended and might be my best bet. Perhaps you could suggest a different one, or which one of these is the best buy for me?
Michael Harris, Taunton, Somerset.

You've all but answered the question yourself. You want a 24-pin, dot-matrix printer, Epson printers are too expensive and you like the Citizen device. With the exception of one tiny suggestion, therein lies your answer. Buy the Citizen. It's reasonably priced, Citizen is definitely a company to trust, Citizen's equipment is well-made and good quality and so on.

The one suggestion? Star. The LC24-10 is also a very good printer, cheap (£399) and will do everything you want. So there you are. Two good printers, each with lots to recommend it and with little difference in price. I suggest you draw the winner's name from a hat, or make your selection using the tried and tested pin-and-closed-eyes method.

HELP! Devpac vs. AMOS

I'm thinking of buying *Devpac* for my Amiga, but I don't know if I'll be able to get to grips with it. I have never tried machine code or anything like it before, and I'm beginning to think I should just buy *AMOS*, as I can handle BASIC. I'm OK at maths, would that make me any better at coding? Tell me straight. Should I take a chance at *Devpac*, or get *AMOS*?
Rob Morris, Sketty, Swansea.

Remember when you first began to use BASIC? Loops, strings, GOSUBs and all the other commands sounded like a lot of gibberish and you felt completely baffled by the whole thing. But now you've mastered BASIC, it's as nothing to you, right? Buy *Devpac* and in six months – three, if you're diligent – you'll be at the same stage as you are with BASIC.

Using assembler is no more difficult than using BASIC, although fully mastering assembler does, perhaps, take a little longer. Of course, the choice depends very much upon exactly what it is you want to achieve. If you're happy writing little games that don't require great speed or access to the Amiga's operating system then stick with BASIC. Invest the time you'd have spent learning assembler into perfecting your BASIC programming techniques and you'll be able to produce quite stunning code.

On the other hand, if you desire to become the master of the system you survey, writing neat little utilities, extensions to the operating system and exploring the Amiga's many possibilities, plump for *Devpac*. It is an excellent tool, powerful and perfect for getting to grips with all things hex.

Straight answer, right? Here goes: buy *Devpac*.

HELP! CP/M solutions?

Recently I purchased a SVI-738 MSX machine complete with a 3.5-inch single-sided disk drive built in. The manual said that the machine runs not only MSX-DOS but also CP/M.

The CP/M operating system disk was included as proof (CP/M 2.2 to be precise). Unfortunately, I am absolutely unfamiliar with this standard. The only thing I know is that it is very badly supported here in Egypt. Please, if possible, let me know how I can obtain CP/M 2.2 software, maybe through some mail order company or PD library.

I also don't mind if you print my address for those eager to help me.
Vladimir Aqapod, 19 Aziz Abaza Street, Zaualek, Cairo, Egypt.

Worry not. CP/M was a phenomenally popular and successful operating system that still has many supporters. Lots and lots of excellent-quality software was written for the operating system and there's a huge – and thriving – public domain scene (for an explanation of public domain software get hold of a copy our sister publication *Amstrad Action* which is currently running a series on all things PD). You'll find word processors, spreadsheets, database, the lot available for CP/M. Tho only problem you might have is the disk format – 3.5-inch CP/M disks are unusual.

You must become familiar with the CP/M command system if you want to get the most from your latest silicon acquisition. The best way to achieve this is to get hold of a good text book. One of the best is *Mastering CP/M* by Alan R. Miller, published by Sybex (ISBN0-89588-068-7) and priced around £13. It's not much use quoting exchange rates as import taxes and other considerations have to made before determining the price of the book in Cairo.

Next step is to join a CP/M user group. This will give you access to lists of CP/M software suppliers, and help and advice from canny CP/Mers. The best CP/M group to join is The CP/M User Group. Contact it at 72 Mill Lane, Hawley, Dartford DA2 7RZ.

So you see, there really isn't any need to panic about CP/M on your new MSX computer. Oh, and any kindly Techtippers out there into CP/M? Write to Vlad direct with useful addresses, PD programs and other trinkets. ■

HELP! Tackling the TV with a soldering iron

I've been using a Sony Trinitron colour television with my BBC B 32K microcomputer for several years now, and although this set-up suits my needs, I feel that in this age of electronics I really would like to have a proper monitor.

Unfortunately, I don't have enough money to actually buy a colour monitor. Several hundred pounds is much more than I can afford. So I've decided to convert my television to a monitor. This should be easy as I've used a soldering iron before. What I need you to tell me is how to go about performing this operation. I also need you to print a full circuit diagram for the Sony Trinitron television so I can find my way around inside it. I'm sure many other readers of your Tech Tips pages require this diagram too. And finally, what tools do I need to carry out the job? I already own a 35-watt soldering iron – so that's no problem – but do I need to have a multimeter and jeweller's screwdrivers?
Philip R. Atkinson, Mayordean, Wilts.

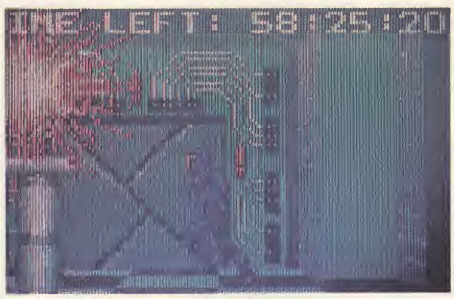
Do not under any circumstances, open up the Trinitron's case and attempt to make modifications. The domestic television set contains extremely large currents that will certainly kill you if you come into contact with them. Only a qualified TV engineer should attempt modifications to a television set.

Right, that's that out of the way. You obviously have not one iota of electronics know-how – 35-watt soldering iron, indeed! The largest wattage soldering iron to use with delicate electronic components should be around 15 watts, and even that can destroy transistors and the like if used for long periods. If you're interested in techno-tinkering, get along to your local library or book store and cast an eye over the Bernard Babanni series of mini tinkering manuals. These will tell you the correct tools to buy and will provide you with some easy experiments to get you used to using them. Then, and only then, should you attempt modifications of anything even vaguely expensive (and that doesn't include TVs. Remember what I said earlier?). As for printing circuit diagrams of the Trinitron, that information is probably only available to appointed service centres, is probably entirely uninteresting to anyone but yourself and is outside the scope of our little column anyway.

And for anyone who didn't get the message: don't put your fingers inside television sets. You will almost certainly be killed.

The hand-held games console arena has been revolutionised by the arrival of the Gameboy and the imminent colour Lynx. Tony Takoushi put the tiny pair through their paces, and was impressed...

• The Lynx. Atari's hand-held wonder offeres 16 colours on screen from a palette of 4,096. It's virtually a hand-held Amiga!



• Electrocop is a derivative of Impossible Mission. You are a robot and have to save the President's daughter and destroy a robot that has gone out of control.

• Several machines can be linked together with Comlynx cables. Head-to-head gameplay adds enormously to the fun of the Lynx

LYNX

AROUND £120 • ATARI
0753 33344

The Atari Lynx is a revolutionary colour hand-held games console employing a 65C02 main processor running at 16MHz – some 10 times faster than the good old Commodore 64.

With a colour palette of 4,096 colours with 16 colours on screen at once, a screen resolution of 240 pixels across and 192 down, or 480 across by 192 down, the Lynx represents a major leap forward in miniaturised performance.

The unit measures 20cm across and 8cm down, and is around 3cm deep. The TV screen is around 8cm across, with a joypad to the left, as are the On/Off buttons. To the right of the unit are the fire buttons (two, marked A/B) at the top and bottom. The duplication is for left-handed players as there is a built-in hardware option that allows you to flip the screen upside down and turn the unit around.

In addition there are two Option buttons and a Restart button.

The top end of the unit features ports for headphones; 'Comlynx' which allows you to play a game with friends if they link up their machines to yours with a cable; mains power, a necessity as this piece of silicon guzzles batteries; and a volume control, which is inoperative if you plug the headphones in.

The bottom end of the unit has a brightness control, which means you can play it just about anywhere and not worry about the screen contrast. The underside has a compartment for six pencil batteries and ➤

SMALL IS BEAUTIFUL

GAMEBOY

AROUND £100 • NINTENDO
01-836 2973

Nintendo has been a major force in home entertainment for the last six years, and in an extension of the concept of video leisure it produced a portable, hand-held games system called the Gameboy late in 1989.

The unit retails for around £45 in Japan, but in the UK it sells for £100. It comes as a package with the game *Tetris*, and a video link cable.

The machine fits snugly into the palm of your hand with a joypad and control buttons A and B. It has stereo sound, and a pair of headphones are supplied, which plug into the bottom of the main unit.

Its viewing screen is approximately 5cm square, and is a liquid crystal display. This is the only real drawback of the system. To get a clear view of the game you are playing you have to adjust the contrast, and even then it gets a bit awkward to view if you move the unit out of tilt slightly while playing – this tends to happen as you get carried away playing.

There are separate controls for contrast and sound, and an external connector port for linking several Gameboy units together. This is one of the nicest features of the Gameboy – you can link up your machine via a cable (costing around £6) to a friend's and try to beat them.

The unit runs on four pencil batteries and these give around 20 hours of use.

Its games come on cartridges measuring around 5cm square and 1cm deep. They slot into the back of the main unit and typically cost around £12 each.

GAMEBOY SOFTWARE

On its launch four software titles were available: *Super Mariosland, Alleyway, Shanghai* and *Tennis*, with several others on the way.

Super Mariosland is a scaled-down version of the arcade version, but still has lovely playability and the depth that made the original an enormous world-wide hit. The action takes place against a scrolling backdrop and you have to get your power coins. There are some nice touches, with Marios flying around zapping in his little cycle plane, and of course he gets to give Daisy slushy kisses at the end of each stage.

Tennis is pure and simple with good animation and really super playability. Nintendo has captured the playability of the games on the home console, and transferred it to the Gameboy.

Pinball is a HAL Laboratories title and is fun. The title sequence has three hippos (at least I think that's what they are!) grooving on down to a bouncy tune. There is a two player option and the main action takes place over three screens, with screen-flipping as the ball travels between them. There are many bonus screens to work through, and if you like your pinball mean and fast then this is for you. The music is excellent and fits in well with the action.

Alleyway is a *Breakout* clone with plenty of ➤

• The Gameboy: smaller than the Lynx, it lacks the Atari's colour capabilities but is a very capable machine nonetheless.

• Tetris is bundled with the Gameboy and is the perfect complement to the tiny hand-held. Tetris could have been designed for the machine.

ANNOUNCING THE NEXT GENERATION OF PBP GAMES

STEVE JACKSON'S

GLADIATORS

OF THE ROMAN EMPIRE

Your opponent falls!
He's badly wounded!
He can't continue!
Yes! HABET!

He holds his finger up
in a plea for mercy!
The choice is yours.
Spare his life?
Or finish him off?
What would YOU do?

In this fast-moving interactive telephone game from Steve Jackson, creator of FIST, YOU control your gladiator in a kill-or-be-killed battle to the death. Your opponent? You may fight the infamous Spartacus (controlled by the computer), whom you will find to be a difficult opponent. You may fight another caller. Or, if you chose to create a Match-Up Code, you may even fight a friend who has arranged to call in at the same time! Your instructions – which body area you wish to attack and which you will defend – will be carried out faithfully by your gladiator. And you will HEAR the moans, the screams and the roar of the crowd as sword meets flesh! The game couldn't be simpler to understand. First choose your gladiator from an authentic list of real gladiators from history. Then enter the arena....

FIGHT YOUR FRIENDS TO THE DEATH! USE MATCH-UP CODES!

If you wish to fight a friend through the *Gladiators of the Roman Empire* computer, you must first of all:

- Decide a 4-figure *Match-Up Code* between you. A number you will both remember.
- Arrange to dial in at the same time.

As you enter the game, you can enter your Match-Up Code. If you do so, you will ONLY fight an opponent with the same Code.

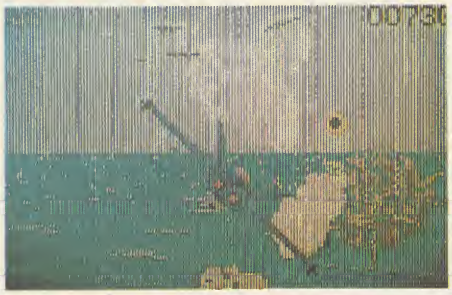
So settle your differences in the noble way in a battle to the death in the arena!

COMBAT SYSTEM

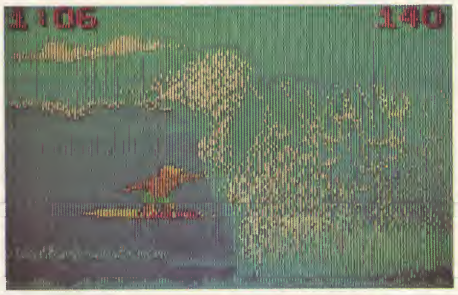
Dial in two numbers from 1-4 each combat round to represent where you will attack and defend. 1-2-3-4 equals Head-Body-Arms-Legs. The computer does the rest. Listen to the commentary to find out whether your attack was successful. Hint: The area you choose to defend is not the only area you guard. You will also defend one of the two adjacent areas as well.

0898-800-891

Calls charged at 25p per minute cheap, and 38p per minute other times. Computerdial Ltd, 7 Leapale Road, Guildford



• Blue Lightning *rates as my favourite. You have to fly missions into enemy territory destroying radar bases, jets, convoys and airfields. You are given a first-person perspective and you literally zoom down out of the sky, dipping up, over and down between trees to avoid missiles, all in true perspective. You can fly low over rivers, around mountains or manoeuvre in deep valleys.*



• California Games *offers four sub-games: BMX, Surfing, Halfpipe and Footbag. My favourites are BMX and Surfing. BMX has you doing wheelies over logs and powering over hilly terrain against the clock. It is exhilarating to play and needs a high skill factor. Surfing is something else. You have to guide your surfboard doing tricks – try doing four 360-degree flips off the top a cresting wave. Wipeout!*

• Gates of Zendocon *is a Nemesis clone. As well as the starting level there are two other difficulty settings. The enemy attacks are fast, with strings of aliens and the standard motherships to blitz. This is a very good game with a scrolling backdrop that rolls up and down. The graphics are colourful and detailed, and show just what the Lynx is capable of.*

games are slotted into the unit via a flip-lid compartment in the left-hand end.

The games come on very tough plastic cards and measure 4cm square. To start play you press the On key. There is a slight pause as the system boots up and then the title screen appears in glorious colour. Seven games have been announced for the system: *California Games, Blue Lightning, Gates of Zendocon, Electrocop, Rampage, Gauntlet* and *Chip's Challenge.*

The Lynx is available in limited quantities in Japan and the USA, with plans to ship into Europe early this year. It will cost around £120 and games will be around £20 each.

The Lynx hardware allows zoom and scaling effects to be executed extremely quickly. Objects flash in and out of perspective and size. The Lynx was designed by the Amiga hardware designers, so any of you familiar with the Amiga's processing power should know what that means.

LYNX SOFTWARE

I have played all seven games, and the four that are available are reviewed above. *Rampage* is a good clone of the Bally Midway original but, as with the original, it's a trifle repetitive. *Gauntlet* is very tasty and is played with the machine side-on and the screen vertical. The heavy action and slashing will keep you on your toes.

Chip's Challenge is a series of abstract puzzles which you have to solve within set time limits. *Challenge* is an unusual game which at first glance you would think is quite slow and boring, but once you start playing and thinking it will grab you and prove completely addictive.

There are no firm dates as yet for releasing these three titles. However, the excellent *California Games* comes bundled with the machine when you buy it, and *Blue Lightning, Gates of Zendocon* and *Electrocop* are available now. ■

THE HOTTEST HAND-HELD?

All in all the Gameboy has turned from a promising item into a treasured piece of plastic. The screen is LCD, and that is the only real flaw with the system, but if you can accept it then it has some great games at a very affordable price.

The Lynx is a mind-boggling machine. It is not cheap, but then you get what you pay for. It is best described as a cross between the Atari ST, Amiga, Megadrive and PC Engine – that is how powerful this machine is.

The Gameboy is quite a bit cheaper than the Lynx but offers only a fraction of the processing power and a less glamorous presentation. Make the choice to suit your pocket. ■

added touches and bonus stages to work through. This game is deceptively simple but it really does grab you. It is perfect for the Gameboy as all the controls you need are the ball-launch button and the joypad to move the bat left and right.

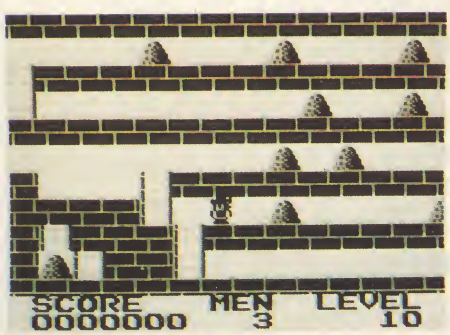
Shanghai is an Activision game produced under licence to HAL Laboratories. The game is a mah-jong derivative, with you picking off matching tiles that are stacked laterally. The game has many options and if you complete a sheet you get to see a dragon and a zippy little tune is played.

I have been a fan of golf games since I discovered *Winning Shot* on the PC Engine, and *Golf* on the Gameboy delivers the goods. You can play one or two players, there is a game save so you can play the number of holes you want and complete the round at a later date. There are two courses: Japan and the USA. The B button allows you to view the whole course and putting green at any time, and if you press the joypad down you can change club. There is a close up of the lie of the ball with total yardage, wind direction and score in relation to par at the bottom of the screen. To strike the ball you press button A and a power gauge appears. When hit the screen follows the ball and the direction cursor automatically points to the hole as you prepare for your next shot.

In *Puzzleboy* you direct a boy through various mazes and try to reach a set of stairs which leads to the next stage. To get through each section you have to work out as quickly as possible how to get past various objects.

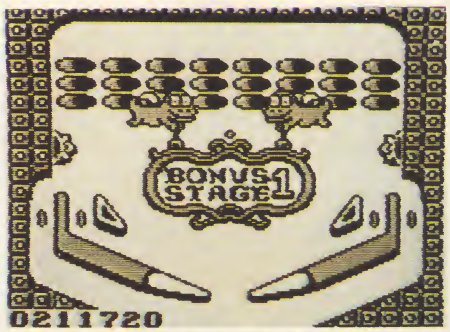
Dracula's Legend is a conversion of the hit Nintendo coin-op *Castlevania*. It has many elements from the original, but has been tweaked for the Gameboy. You have a timer ticking down to complete each stage of the game, and you have to guide your character using his whip to slash birds; boulders, zombies and torches to collect coins and power ups. This game has the playability of the original and the graphics are finely detailed with good sound effects.

Motocross Maniac may remind you of the Nintendo console game *Excitebike*. It is very similar, with your biker having to qualify for rounds and racing against the clock. Again great playability makes this an excellent game, although it does take some time to master the moves. The final two games are *Hyper Lode Runner* and *Tetris*, and these closely follow their originals on the home computer and arcade formats. ■



• All the Gameboy's *software features sharp, clear graphics on the machine's LCD screen. Unfortunately it is very dependent on angle and ambient lighting.*

• Super Mariosland *is firmly based on the arcade original, and it retains the coin-op's instant playability and addictive qualities.*



• Hand-held pinball *may seem a slightly strange prospect, but that's what you get with the Gameboy. The action is surpisingly fluent for a computer simulation.*

520ST-FM SUPER PACK

1Mb DISK DRIVE
£450 OF SOFTWARE

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FREE ATARI BUNDLE VALUE: £458.97

The Atari Super Pack is ideal for you if you want to get off to a flying start with the best in entertainment software. The Pack includes a 520ST-FM with ½Mb RAM, a built-in 1Mb disk drive, over £450 of top games and a joystick. If you buy the Super Pack at Silica Shop, we will add our own ST Starter Kit (worth over £200), Free Of Charge. Return the coupon for details.

£399 INCLUDING VAT

With SM124 mono monitor: £498 INC VAT

With SC1224 colour monitor: £698 INC VAT

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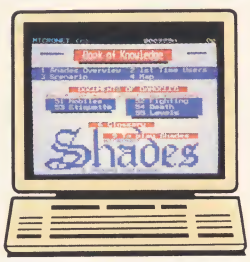

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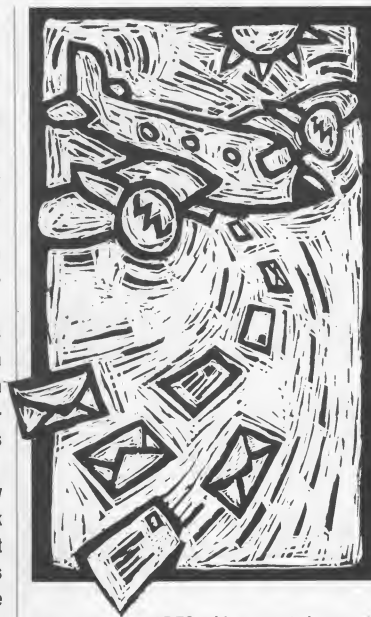

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A colonial writes

I'm an American and moved to London just a year ago.

In America, PCs, consoles, and to a lesser extent STs and Amigas, are all used in large numbers by the home market. Having moved to England I expected the situation here to be the same as in America, and generally it was, although in England there is probably a greater percentage of 8-bit micros.

Being a computer professional, as soon as I was settled I decided to buy a 'home' computer. My eye was either on a 286 PC or an Amiga, then I saw a computer called the Archimedes. Why is this computer frowned upon?

I went to an Acorn dealer and saw the machine running and had a long talk with the owner of the shop, who said that most people consider the Archimedes overpriced. At this point I thought there was something seriously wrong. How can a computer with the capabilities of the Archimedes be considered overpriced?

After talking to some people from my office, it emerges that Acorn has a reputation for overpricing computers.

The Archimedes has one of the most advanced operating systems and, even in this incarnation, is far and away more comprehensive than anything System 7 will bring to the Mac. And it is so easy to use that within half an hour my eight-year old son Elliot was setting up RAM disks and could use ADFS with a great degree of competence.

I have bought an Archimedes, and consider it something of a bargain – for this much power I would need a top-end 68030 or the fastest 386, which tend to cost thousands of pounds. I think you should also spare a thought for Acorn, which is one the few companies which not only designed its own processor but the operating system as well – both of which, in my mind, leave the rest behind.

Judge the price of the Archimedes by its computing performance, not by Acorn's past record.

PS, English beer is very strong compared to all the American watered-down stuff I'm used to.

Ellias Braithwaite, Kenton, Middlesex

At last, a sensible letter to *Express* – we totally agree about English *vs.* American beer. Watch out for the fully-comprehensive Shopping Express Buyers' Guide to the 50 Best Real Ales – coming soon, as soon as we've finished the research.

PD profits

While agreeing with the writer of a recent letter that a healthy profit seems to be being made by some public domain dealers, I'd like to point out some of the costs incurred to the PD retailer. As a small-time supplier of PD I feel quite qualified to comment. The costs are as follows:

Cost of blank disk	40p
Cost of Jiffy bag	25p
Postage one disk	35p
Postage 10 disks	90p

Howls of outrage deafen the Express office as Amiga owners take revenge on an STE addict

It is clear that Matthew Howkins has never used or heard an Amiga. It is nice to hear that the STE has three voice YM2149s that can produce "sound effects such as explosions and gunshots", but he is maybe interested to hear that the Amiga has four channels, which can each play sampled music with unbeatable quality. I prefer to play Schubert's *Marche Militaire,* Opus 51, on my Amiga rather than "explosions and gunshots". It is also important to remember that all four channels can be played without slowing down the main CPU.

As for the graphics, most of the newly-released games for the Amiga use 32 colours, and many professional packages can handle up to 64 colours. There have also been games written to use 64 colours, even though I think that is a bit over the top. However, if you intend to do anything professional on a computer, many colours are vital, and the Amiga is still unbeaten.

Matthew also brought up the old theme – 'my computer is faster than yours'. I agree that the STE has a faster CPU which runs at 8MHz, while the Amiga's 'only' runs at 7.14MHz. However, this is like comparing a neanderthal with his big stone and a modern soldier with a gun. The neanderthal may be stronger, but the soldier is much better-equipped.

The STE may have a faster CPU, but the Amiga consists of a main CPU running at 7.14MHz, a video chip which takes care of the screen and colours, a blitter (not comparable with the STE's) which not only can move data with lightning speed, but also logically combine or change the data, eight hardware sprites which can be reused, four sound channels, and so on. There are total of three co-processors and 25 DMA (direct memory access) channels, which all work independently, and will therefore not interfere with the main CPU.

It is also totally untrue that "the Amiga's multi-tasking OS is of no benefit since there is not enough memory". I am a programmer and have only a 1Mb Amiga, but that allows me to have my editor plus several other small programs and utilities running at the same time as I compile. I can even have my files stored on the RAM disk, and I have still memory left.

Furthermore, anyone who has ever used a multi-tasking OS can not live without it afterwards. If you develop programs as I do, or is just use the computer as your hobby, multi-tasking makes a joy of it. As I print out my code, I can edit and compile it, plus run the program, all at the same time.

Finally, it is good to hear that the STE can have a resolution of 640 x 400 pixels, but I can not see how that beats the Amiga's 704 x 576 mode.

Anders Bjerin, Richmond, Surrey

I felt after reading Matthew Howkins drivel in *Express* 62, that I'd better put him straight on a few things on the Amiga and STE.

Firstly the Amiga has excellent sound. Secondly the reason there's so many 16 colour games on the Amiga is because it's dead cheap to port ST crap over to the Amiga. I think you'll find that things like *Shadow of the Beast* (128 colours) fit quite well even in half a megabyte. As for scrolling, if Matt knew what barrel shifting was then he'd shut up.

On the subject of speed, the Amiga is faster than the STE and the QL because of its custom chips, allowing screen co-processing (via the copper), music and scrolling without even using the 68000. I agree, however, that Workbench is not as good as GEM, but then GEM does not have a command line interface.

By the way, multi-tasking works well on even a half megabyte. With Workbench in a reset-survivable RAM disk, it's not bad. Does Matt know that you can get an 8Mb Amiga, a 68030 card with 32-bit RAM, etc etc?

Me biased? Yes, you guessed it, I've got an Archie!

And as for *AMY68* Amiga emulator, I'll believe it when *Shadow of the Beast* and *Battle Squadron* are running on my mate's ST! Notice I haven't even mentioned about the incompatibility of the STE?

Chris Arthur, Cwmbran, Gwent

Well, I wonder what the odds were in the *Express* office, on how many letters you would received after printing the misleading letter by Matthew Howkins concerning the new Atari STE.

Now listen Matthew, to put an argument across effectively, you have to try using facts, although some newspapers might disagree. I would advise you to think about little things like overscan, EHB, HAM and the blitter, which incidentally is faster than on the STE, before making disparaging remarks about the Amiga.

The Amiga is an extremely versatile machine, that's why its sales are rapidly catching up with the ST's, and why the STE will never have a national or for that matter international user base as large as the Amiga's.

Personally, rather than compare an STE with a Macintosh, I think the comparison should be this: an STE to an Amiga is like an Escort to a BMW. They are similar, but which one would you rather have?

J Riding, Chorley, Lancs

I notice that you have started to introduce more humour into the magazine, or at least that's what Matthew Howkin's letter (*Express* 62), has led me to believe –

Total: £1.00 for 1 disk, £5.25 for 10 disks.

So as the bottom line we could say that if the supplier asks for £2 a disk they are making between £1 for one disk and £14.75 for 10 disks. This disregards the outlay for the original disks; wear and tear on equipment; the time taken (even cleaners get £2.00 an hour); the huge cost of advertising; electric power; the list of overheads goes on.

Even the most conservative estimate would add another modest 50p to the cost of the disk. The 50p 'profit' resulting means that more PD disks can be obtained so the library can increase in size – remember the disks still cost 40p to buy without the PD software. To bring the price down a bit I run a system along the following lines: send me a blank disk/disks plus return postage, for five and below I charge £1 per disk and for more than five, 75p per disk.

All PD companies are not the same!
Andrew James, 48 Monkton Road, Alverstoke, Gosport, PO12 2BQ

Indeed all PD libraries are not the same. Some have enough nous to get a free ad in *Express* by writing a letter.

Arc light

With reference to your review of the year in *Express* 59/60 it was good to see the launch of the BBC A3000 featured as one of the highlights of the year.

With 4MIPS of processing power, multi-tasking and 32-bit RISC power we certainly agree that the machine is impressive – bringing a new level of power affordable to the home user.

However, your review has two inaccuracies that I would like to clarify.

Firstly, BBC emulation is included on one of the two application disks that come as standard, including several other applications such as *Paint, Draw, Edit,* etc. Secondly, the price of the system unit is £649 and not £699 as quoted.
Simon Lovesey, Marketing Manager, Acorn Computers Ltd.

Actually it costs £744.10 when you allow for the taxman.

Who needs security?

Two things, unless I get carried away! First, I am yet another of the teeming millions who demand a section on public domain programs on pain of death – yours of course, silly, not mine.

Secondly, this question of hacking. While I basically agree with Comment in issue 56, and also with your condemnation of that nerd Anon in issue 58, I wonder whether your claims that computers have to be fully networked and switched on all the time, and that computer managers must waste so much valuable time and money trying to ensure 'un-hackability', are entirely justified?

Could it be that they like to shoot themselves in the foot, and that the use of a certain amount of that remarkably uncommon quality, common sense, in the organisation of a computer system might well save a lot of hassle?

Is it not reasonable to suggest that this passion for cramming everything into one box may well be the major cause of the trouble? If I were responsible for setting up a system, my first job would be to sort out which areas of company information had to be available to the bulk of employees, and which were sensitive, such as the accounts and research-and-development figures.

The common information would all be placed on the networked file server's internal hard disk, but the sensitive data would be kept on an entirely separate external drive, preferably in the system manager's office, with its own power plug and removable section of data lead which could be locked away in the office safe.

If it ain't connected, it can't be hacked, no matter how expert the hacker claims to be.
John Smart, Hitchin, Herts.

On the PD front, we give in. We will be starting a regular PD column in *Express* in the very near future.

As to your second point, if some data is kept separate from the network it rather defeats the point of having the network in the first place doesn't it? Also the fact that there is no sensitive data on a system does not make it proof from destructive hackers, so the system manager would still have to concern themself with security.

Coupé de grace

I would like to take this opportunity to clear the air concerning Mr Spragg's reply in *Express* 58. Firstly, can I state that my letter (*Express* 55) was written tongue-in-cheek; it was never meant to be anything other than a blatant advertisement for the SAM Coupé. However, if he wishes to get serious about it...

My letter was about a home computer that was cheap. This does not mean in any way useless. As you said, the Z80 is hardly obsolete. It can perform the jobs that an 'average' computer owner wants it to – that is to play games, write occasional letters and maybe do a touch of programming or database work.

Mr Spragg even gave reasons to why 16-bits are dispensable – when you type your latest novel for your pen-friend, you're unlikely to suddenly want to draw fractals. But I'm sure an 8-bit can draw fractals, but slower. It all comes down to speed. And whether there is a requirement for it.

In fact, he refers to the 8086 and the 80286 chips on the IBM-compatible computers. But isn't the 80286 a superior chip to the 8086? If so, why are there still so

obviously, the man has never used the Amiga, and has next to no knowledge on the subject of computers.

Firstly, the sound difference. The YM2149 of the STE is really only suitable for playing those annoying tunes that you get over the phone when you're put on hold, and is less suitable for making explosions and gunshots than the average inflated crisp packet. As for the "stereo digitised sound", this is limited to six pre-set sample rates.

Next, the graphics. Well, 4,096 colours are pretty useless on the STE as you can only display 16 at one time, and as for the comment that changing the palette at various positions on the screen is simple, well, perhaps he ought to try doing it! Playing with interrupts is no fun at all, and when the timing is as critical as it is with the average TV frame, it is damn hard to do!

As well as this, not "most" but some Amiga games only have 16 colours on screen, as the software houses, who are only too glad to take your money off you, are not took keen about redrawing the graphics for the Amiga, and to use the ST ones instead. Incidentally, a 32- colour low-resolution screen takes up 40K, and the Amiga has 512K. Now, I may not be a genius at maths, but in my experience, 40 is a lot less than 512, and so the 16-colour screens are obviously not used because of memory restrictions.

Oh, and incidentally, the Sinclair QL does not run faster than the Amiga. The processor (a 68008) may run at 8MHz, but don't forget it only has an 8-bit data bus, and none of the famous custom hardware that the Amiga has, which means that the machine is actually a lot slower. Anyway, if it is faster, how does he explain the PD QL emulators on the Amiga which actually run as fast as a standard QL?

Mr Howkins then waffles on about multi-tasking being useless – well, has he ever used a word processor on the ST, typed in a nice big document, then realised his disk is full, and needs one formatted sharpish? What can he do? Quit the program, format a disk, lose the document from memory in the process, and start again, that's what. Unless of course he remembered to install that Desktop accessory that lets him format disks, which is unlikely.
J Devereaux, Perton, Wolverhampton

After reading Express Mail in issue 62 I felt I had to put pen to paper like Mr Howkins and air my views about the new Atari STE.

Firstly, the sound quality of both machines. Admittedly the STE has a quality sound chip, the three-voice stereo YM2149, which is a massive improvement over the ST one but it still does not beat the Amiga chip. The Amiga chip can produce four-channel stereo sound – and, by using some clever programming tricks, more are possible (although with a loss in sound quality). Mr Howkins also points out that the ST and the STE have the same built in MIDI ports, although this is an advantage to those on a tight budget wishing to experiment with MIDI, third-party systems for the Amiga are available at a very low cost.

The new colour palette of 4,096 colours will hardly make any difference to games software as only 16 can be displayed on screen at the same time. The Amiga, though, has the capability of displaying 16, 32 or 64 on screen at the same time – although 16 or 32 colours are used most often as extra-halfbrite mode uses a substantial amount of memory.

The new STE may have horizontal and vertical scrolling but that should have been implemented with the original ST and is not such a good thing as Mr Howkins thinks it is. Atari had to include this feature in the STE because quite frankly the CBM 64 had better hardware scrolling than the original ST. The new STE may well have faster scrolling than the Amiga, but what is the use of having fast scrolling when there is a limit to how fast a shoot-'em-up can scroll before it becomes completely unplayable.

Mr Howkins states also that "it's fairly obvious that an 8MHz 68000 and a blitter is better than a 7.14MHz 68000 and blitter." Mr Howkins fails to realise that many programers have said that a blitter was hardly any use to them at all in some of their games. For instance the programmer behind a certain Domark release last Christmas was quoted as saying, in a rival company's magazine, that the only thing the blitter was good for in his game was shifting background graphics. Mr Howkins also fails to point out the other custom chips in the Amiga, the 'Pad' set of chips, Paula, Agnus and Denise. These three custom chips are allowed to access the memory directly, ignoring the CPU, much like the STE's sound chip.

On the business side the Amiga is not as well supported as the ST, but there is some extremely-high-quality business software around such as *KindWords, Superbase,* and *K-Spread.*

Contrary to what Mr Howkins thinks, if time is taken to learn Workbench it can be a delight to use. If Mr Howkins thinks that the STE's Desktop is excellent when he sees Workbench 1.4, with all the new features included in it, he will reconsider this view.

Mr Howkins quite clearly just wants to convince himself that the has made the right choice in buying the STE. Although the STE is a good all-round computer, like the ST, it still not as good as the Amiga. May I suggest Mr Howkins that you read issue 44 again and also the recent issue in which programmers gave their views on the STE. That it is: "Too little too late".
Iain Finlayson, Bearsden, Glasgow

Now that the Amiga owners have had their say, brace yourself for the return of the Atari addicts...

many users with 8086s? And why do most of them stick with it?

There will always have to be machines that will introduce the general public to computers. I think the SAM Coupé fills this role. Whether he agrees or disagrees is up to him, but they are far from useless.
Ton Voon, Shephers Bush, London

There is a lot of snobbery in computing, but it ought to be a case of horses for courses. Computers are tools (even when being used to play games), and, like any tool, you choose the appropriate one to do the job. The fact that the ST and Amiga have an extra eight wires in their data bus does not make all previous efforts instantly obsolete. There is a lot of life left in 8-bit computers yet.

It's in the mail

With regard to the 'mail order companies are the best thing since sliced bread' versus 'mail order companies are the tools of the Devil' debate, could you please explain why it is that none of the advertisers in your own magazine, or any other computer publication I have ever come across, appear to be members of the Mail Order Protection Scheme (MOPS).

I cannot pretend to understand all the implications of membership of the MOPS scheme, and also am a bit hazy on how it works, but unless I am very much mistaken this should remove a lot of the risk involved in buying from these mail-order companies.

Secondly as a computer professional who works in the financial sector of the business, here are some of my views on the problems of computer security, data protection, and hacking.

While it is entirely wrong to go dipping into other people's files, computer managers must by now realise that when they link up their computer system to the outside world they should take steps to protect their data. If they do not take at least the very minimum of measures, it is tantamount to leaving the office unlocked when they close up for the night.

I realise that people will immediately say that this is an unfair analogy, and that the proper approach is to stop people wanting to go and view or change other people's data, but, in the last God-knows-how-many years we have still to convince a small minority of the population that it is wrong to break into locked houses and steal other people's possessions. I find it hard to think that we will have any more success with a small group of hackers.

Another point that should be kept in mind when addressing the thorny problem of computer security, even if you do not have a network set up with the external world – the tea lady and the office junior often have completely unrestricted access to the computer system. Unless some reasonable method of password protection is employed your data is vulnerable, not just to hackers *per se*, but also to anybody with a knowledge of computing who may enter your office.
Ewan Russell, Cadbury Heath, Bristol

We are not a member of the Mail Order Protection Scheme because it is only available to national newspapers, not magazines.

Lovely ads

I thought I would write in to give my views on the letters in *Express* 59/60 about adverts and magazines.

This debate seems to have been raging since magazines were first invented. It's the old story of your not *having* to read Shopping Express, but when you want a cheap printer or something like that, Shopping Express is there to help. As for classified ads – sure get rid of them, until I want to sell something, right! Wrong! Come on everybody, if you don't like it, don't read it, but I find it helpful and interesting – and its free!
Simon Daniels, Long Buckby

Fleet Street errors

With regard to the comparison between *Fleet Street Publisher* and *Calamus* in the last issue of *New Computer Express*: The reviewed version of *Fleet Street* was not the final version, and this point was not stated clearly in the article.

I can only assume that Jerry Glenwright has based his comparison on the preview version I gave him at the beginning of November. We have made several changes and improvements to the specification of the release version, which is due in February. I hope you will give me the chance to detail these improvements in a future issue.
Jon Norledge, Mirrorsoft Ltd

Our apologies for the confusion, and we will of course give *Fleet Street Publisher* its due in a the next issue.

Naked horror

I feel that I must protest at the shocking scenes of sex and violence which periodically raise their ugly heads in *Express*.

In Issue 61 you once more felt the need to display, in graphic detail, a full frontal picture of an Atari 800XL devoid of any clothing whatsoever, posing provocatively amongst various instruments of torture. And this was prominently displayed on the front cover where small children could easily be exposed to this depravity on the newsagent's shelf.

To make things worse, inside the same issue you shamelessly showed the same naked model being brutally beaten to death with a wooden mallet. Are these the kind of images that we want today's youngsters to grow up with?

Now that you have moved to plush new offices, I hope with all my heart that one day you may sell enough copies to move your subscription department out of that old barn. It must get awfully draughty in there during the winter months.
The Android, Rhyl, Clwyd.

Heartfelt plea

Could you please, please, please, please, please, please, please, please, please, please, please, please, please, please, please include an Atari 2600 console column in your excellent mag.
Farhan Masani, Clementhorpe, York

No.

Astrology's a science

I'm a bit late writing, so I trust that others have already written to chide you, but I must point out that it is unscientific to say (*Express* 55) that astrology is a load of old tosh. If you had qualified it, of course – with 'I think that' or whatever – I would have no argument.

In my youth I received the usual pseudo-scientific upbringing, and thought the same as you, till browsing through a bookstore I saw a book called *The Science of Astrology*. The conjunction of the two words caught my attention, enough for me to buy the book and try out what it expounded. And I have to report that, to some degree, astrology works. How or why I don't know, but the first duty of the scientific approach is surely to accept facts.

Just to give you one example, some years later I went to a meeting (in fact the inaugural one) of a federation of astrologers. Four complete strangers came up to me and told me my sun sign: three of them added my rising sign also. None made a single mistake. I have had some success at this sort of thing myself.

Of course the rubbish in the newspapers isn't astrology: If you bothered you'd find a lot of interesting research has been done in recent years.

What I am really objecting to is the assumption that because something strikes you as ridiculous it therefore *is* ridiculous. Whoever said that the universe is not only stranger than we think, but also stranger than we can possibly imagine, but it shows a proper humility. The scientific approach is a very valuable tool, but can only operate within its limitations.
Mike Horth, London

I still don't see how a bunch of stars billions of years way can affect my life. ■

Sent to the dungeons for a very long time...

In early October of 1989 I wrote to you at Express Mail informing you of my plight as regards to Mirrorsoft not returning my faulty *Dungeon Master* disk.

After about a week or so I noticed that, after about half an hour of playing, all of my characters would die at once for no apparent reason. I had kept my disk write-protected and so it couldn't have had a virus.

Before I sent my disk, I also tested the disk on my friend's ST, so my computer wasn't at fault.

I promptly sent my original disk back to Mirrorsoft expecting a replacement in about a week or so. I had previously sent my *Falcon* disks back to them and I had replacements within 10 days.

I have written several letters to them asking them for the return of my disk but I have heard nothing. It has now been over six months since I originally posted the disk to them, and I feel that this is a bit much.

In your reply to my letter, you asked me to let you know if I didn't hear anything from them, and you would think about running an article on companies who didn't return their customers' disks. I would be very pleased if you could run such an article, as I have had a *Dungeon Master* box minus the disk on my shelf for a very long time now, and if they were going to return it, they would surely have done it by now.

It is a shame that the company which markets the best role-playing game on the ST has this extremely annoying habit of not returning their customers' disks.
David Brass, Great Haywood, Stafford.

We asked Mirrorsoft why David hadn't received his disks back, and this was the reply:

We agree that it is totally indefensible that anyone should have to spend six months waiting for a disk, and pride ourselves that whenever possible we turn faulty disks around as soon as we can. In the case of *Dungeon Master* on the ST we have had some serious problems in getting copies duplicated, and this has resulted in the game being out of stock for a considerable time. We are trying to get this situation resolved as quickly as we can and hope to have a new stock in a few weeks.

Unfortunately we have been able to find any correspondence from David Brass, but now that we are aware of his long wait he will be top of our list when we get a new supply of disks. In addition we intend to give him a copy of *Chaos Strikes Back*, which we hope will go some way to compensate him for the inconvenience he has suffered.

Mirrorsoft are fully committed to providing the best customer service we can and are very disappointed that in David's case we have failed to do this.
Cathy Campos, PR Manager, Mirrorsoft

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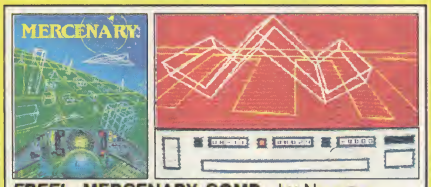

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